

PULP & PAPER

OCTOBER 1949
Vol. 23 No. 11
Member Audit Bureau of Circulations
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The Production and Management Journal Covering
North America's Wood Pulp, Paper, Paperboard
and Cellulose Industries

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SUBSCRIPTION inc. North American Review Number—\$3 for 1 yr. and \$5 for 2 yrs. in U. S., Canada, Mexico and other member nations of Pan-American Union (\$4 for 1 yr. and \$7 for 2 yrs. in other countries).

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EDITORIALS

Currency Devaluation — A Cloud Over This Industry

Currency devaluation in Europe has placed in the hands of the Scandinavian nations the power to destroy or at least to seriously cripple some of the most important segments of the North American forest industries. To what extent the Scandinavian nations use this power remains to be seen.

British socialism and policy men of the U. S. State and Treasury Departments cannot issue any "white papers" to blot out their responsibility for this grave turn of affairs.

Now if history repeats itself, which it has a way of doing, the outlook is very black indeed for those particular segments of the North American forest industries which:

1. Have done the very most of all in reforestation.
2. Are among the most vital of all national defense plants.
3. Have done the most to stabilize hundreds of thousands of jobs of mill and forest workers.
4. Have built up scores of the happiest, healthiest industrial communities of all Industrial America.

We are speaking principally of the great market paper and rayon pulp industries created in the past quarter century in America, and also of those scores of "integrated" paper companies, so-called because they have had the foresight to build up their own wood and pulp resources.

If the European producer takes all the advantage offered by devaluation, he can now dump his pulp in the U. S. market at 40% off, and 30% below the lesser devaluation of the Canadian producer.

Canadian producers also are in a position to demoralize the U. S. market. But the few who might be tempted, should look over their shoulder to the Scandinavians, who can wreck them in turn. It just takes one to start the cutthroat game, and Canadians and Americans would both be the losers.

And the foresight and planning of the integrated mills becomes bitter gall to them if pulp comes in so cheap as to make it uneconomic to develop their own resources.

The critical question today is how much pulp has Europe to spare—how deep will they cut their forests? We know, for instance, Russia has been taking much of Finland's pulp and wood. Would Russia be apt to release that now, if it meant disaster for these U. S. industries? What do you think?

In recent years the No. 1 "goat" or "guinea pig" in creating the greatest increase in foreign dollars of any industry is this one. No other industry has given so much to implement the philosophy of economic internationalism of our State Department: in effect, these forest industries have been used to subsidize automobile and other industries. And now they are to be the principal "goat" again.

And yet when war came and the submarines blocked off the sea lanes, we learned to our dismay that we had to have our own as well as Canada's pulp and paper mills in full production to win a war. Too late, our government tried to freeze labor in the woods and mills. Every product the mills could make—from nitrating pulp to fire guns, and V-paperboard boxes to ship goods overseas, to the paper used for propaganda and a general's war map—was needed critically.

Market pulp and integrated mills both stand to bear the brunt of the blows that may fall as a result of devaluation—from the great kraft mills of the Southern pine belt and the biggest white paper mills of the East and Midwest to the huge market pulp mills of the Far West.

Let us, however, single out the state of Washington as potentially the most horrible example of what may happen. Producing over 2,000,000 tons of pulp, more than 1/6 of the nation's total, it is the greatest pulp state in the union. It markets over 750,000 tons—some Washington state pulp going to virtually every paper mill and every rayon and cellophane plant in America.

Four of these big Washington state mills during the war made virtually all the nitrating pulp the U. S. army used to fire nearly all of its medium and large caliber guns! But when devaluation came over a decade ago, two of the Washington mills were shut down; several others ran at 50% and at less, and kept skeleton crews on at a loss to help pay the grocery bills of employees.

Luckily, that time they survived, and now they pay an average wage of \$1.76 an hour—35 cents higher than any other U. S. mills and much higher than anywhere else in the world. Their woods workers, too, are in this rarified financial atmosphere as wage earners. Ironically, on the very day devaluation in Europe burst upon their world, these mill workers were asking further wage increases or equivalent concessions.

Last year Washington state produced 25% of the market pulp for the U. S., and Scandinavia produced about 17%. Canada produced about 40%. Last year Scandinavia shipped only 575,000 tons here, at a time when pulp was in high demand and inflation was active, and extracted a price 40% to 50% higher than American or Canadian producers. But back in 1937, Scandinavia shipped 1 1/4 million tons after devaluation.

If it happens again who will come forth with a "Marshall Plan" for our most important forest industries?

The Meeting at Sacandaga . . .

Of more than passing interest in September was the two-day session at Sacandaga, N. Y., sponsored by General Electric. Here top mill executives from two great pulp and paper producing areas conferred with G-E officials on problems of mutual interest. Both industry and G-E men contributed to the program and entered into discussions which the carefully prepared papers provoked.

What is perhaps most significant about the meeting was the realization on the part of the planners and participants that modernization, wood handling, finance, purchasing, employee relationships, and marketing are all of a piece and all the responsibility of management in the industry. So closely knit is the average pulp and paper organization, and so delicately balanced in all its parts, that—no matter how well organized—management can neither abdicate nor delegate responsibility except in the most minor phases of the total operation.

A Report on Portland—for Busy Executives

This magazine inaugurated an entirely new approach in the methods of reporting the most important technical meetings of this industry at Paper Week in New York last winter.

We engaged three outstanding authorities in the industry to brief and evaluate important and new features in the tens of thousands of words which hummed through the Commodore.

The response to this new method of reporting, as it was published in our April issue, encouraged us to repeat the procedure at the recent Portland, Ore., national fall meeting. You will see the result in this issue—the six articles by Messrs. Booth, Barton and Hull on six Portland technical sessions—which we commend to you.



THESE PICTURES BY PULP & PAPER show E. L. McCORMACK (left), who has become Special Assistant and Consultant to Res. Mgr. T. R. Stein at Minnesota & Ontario Paper Co., International Falls, Minn., and LAMONT H. BIDWELL, Jr. (right), Supt. of Riegel mill at Hughesville, N. J., who has been elected Chairman of Penn.-N. J.-Del. Superintendents group. We snapped Mr. McCormack, a former Black River, New York, paper industry official, outside his office on Canadian-U. S. border, and Mr. Bidwell at East Coast meeting. Last month we announced Wm. H. Schlafge succeeded Mr. McCormack as Gen. Supt.

B. C. Pulp & Paper Co. Reopening Rayon Pulp Mills

B. C. Pulp & Paper Co., which had temporarily closed down its purified dissolving pulp mills at Woodfibre and Port Alice, B. C., in midsummer, has announced reopening of both plants—Woodfibre on Sept. 13 and Port Alice "about Oct. 3."

The Woodfibre mill employs 493 persons, and Port Alice, 577.

Kimberly Mill Sets Safety Record

The Kimberly, Wis., mill of Kimberly-Clark Corp., which recently equaled its last year's record of 102 safe days, was compiling a new safety record as this issue went to press and shooting for 150 days without lost time accident, topping its 149-day record of 1924. Mill Manager J. T. Doerfler sent a thank you note to employees with their pay checks.



In this corner each month, **PULP & PAPER** will publish the "tallest tales" it can gather from pulp and paper industry men. As everyone knows, there just aren't any better story tellers than pulp and paper makers. Last month's tale was about a mule-driven paper machine. If you haven't heard it, see page 42, Sept. issue.

This month's story is credited to Ted Cooper, a mill executive in Tasmania, who learned his papermaking in England and comes from a long line of paper-makers, dating back to Marchant Warrell, who started the first Fourdrinier paper machine. Mr. Cooper spent a number of years in Canadian and Eastern United States mills and then became assistant paper mill superintendent at the Crown Zellerbach mill in Camas, Wash. He worked there as assistant for six years, under the late Heinie Ostenson, whose brother Gus, is now manager of paper manufacturing at that big mill. **PULP & PAPER** has sent Mr. Cooper \$5 for this story.

E. W. G. "Ted" Cooper is with Australian Newsprint Mills, Ltd., in Boyer, Tasmania.

His ancestor, Mr. Warrell, started up the first Fourdrinier to operate on a commercial basis at Two Waters Mills, in Hertfordshire, Southeast England, on Jan. 13, 1812. He was described as a man "of determination and character."



TED COOPER, Paper Mill Supt. in Tasmania, whose story features in this month's corner.

The interest in the use of straw for pulp brings to mind the story of a big board mill in England which, it was reported, was using considerable barnyard fertilizer in its pulp. Now this furnish was working out very well, indeed, according to word that got around in England except on certain occasions when holes mysteriously appeared in the board.

No one seemed to be able to account for the holes. Experts from all over the world were brought in to study the problem. None were able to solve it until a United States engineer arrived on the scene to look the situation over.

He made a survey and promptly ordered the holes in the roof of the machine room repaired. Result: No more holes in the board.

Importuned for his secret, the engineer explained that he was also an ornithologist and he had noticed English sparrows circling over the roof and landing there. He decided they were attracted by the barnyard delicacy which was an ingredient in the pulp. And that they awaited opportunities to swoop down through the holes in the roof, when members of the machine crew were at a safe distance. He had everyone get out of sight, and, sure enough, the sparrows whipped down through the holes and made off with their tid-bits as the paper came from the rolls.

Springhill Mill Has Bleach Waste Treatment Plant

James Otis, National Council of Stream Improvement is chemical engineer in Springhill, La., to assist in the operation of the International Paper Co. pilot plant, at that location, for treatment of bleachery waste.

The pilot plant is a large scale efficiently engineered plant which will be devoted to the study of chemical treatment of kraft waste and bleachery waste in particular. The plant will be used to investigate feasibility of treating kraft bleachery waste with lime followed by carbonation, sedimentation, dewatering, and recovery of lime by calcining in the plant lime kiln.

COMING INDUSTRY MEETINGS

National

- American Society for Testing Materials — Fairmont Hotel, San FranciscoOct. 14
- Packaging Institute (11th Annual Meet)—Commodore Hotel, N.Y.C.Oct. 24-26
- Nat'l. Safety Council Congress — ChicagoOct. 25-28
- Packaging Machinery Mfgs. Institute (17th Annual) — Edgewater Beach Hotel, Chicago.....Oct. 31-Nov. 2
- Engineers' Conference, Statler Hotel, BostonOct. 31-Nov. 3
- Allied Industries' Luncheon Club—Second Monday of month, 12 noon, Commodore Hotel, New York.

Regional

- Del. Valley Tech. Section — Lake Club, Spring Grove, Pa.....Sept. 30
- Pa.-N. J.-Del. Div. Supts.—St. Patrick's Inn, Mt. Pocono, Pa.....Sept. 30-Oct. 1

- Conn. Valley Div. Supt.'s—Red Lion Inn, Stockbridge, Mass.....Oct. 1
- Industrial Packaging & Materials Handling Exposition—Convention Hall, Detroit, Mich.....Oct. 4-6
- Northwestern Supt.'s—Hotel Duluth, Duluth, Minn.Oct. 4-5
- American Pulpwood Ass'n., Appala-Farm Ceremony") Armstrong Forest Co., Kane, Pa.....Oct. 4-5
- Amer. Pulpwood Ass'n., So. Tech. Committee, Moorehead City, N. C.Oct. 11-12
- So. Eastern Div. Supt.'s—Hotel Roanoke, Roanoke, Va.....Oct. 14-15
- So. Div. Supt.'s—Frances Hotel, Monroe, La.....Oct. 24-26
- Pacific Chemical Exposition—Civic Auditorium, San Francisco.....Nov. 1-5
- Paper Industry Salesmen—Midston House, New York City—Every Monday, 12 noon to 2 p.m.

U. S. WOOD USE SURVEY

AS PRESENTED AT UNITED NATIONS



EXCLUSIVE PULP & PAPER PICTURES at United Nations Scientific Conference. Left—DR. WALTER F. HOLZER, Ass't Director, Central Research, Crown Zellerbach Corp., reviewed chemical utilization of wood in the U.S. for benefit of foreign delegates, and discussed new sulfite processes and new lignin products, as reported in this article.

Center—S. B. SHOW, of Division of Forestry and Forestry Products of UN, who presided; and J. B. B. HARRISON, Secretary.

Right—DR. LOUIS STEVENSON, Statistician for APPA, snapped beside gaudy British roadster belonging to one of the Secretariat—note UN license plate.

Entitled an "experience paper," Dr. Walter F. Holzer, recently promoted to assistant director of the Central Research Department of Crown Zellerbach Corp., and the program chairman of the recent outstanding national technical convention in Portland, Ore., presented a survey of the chemical use of wood in the U. S. before the United Nations Scientific Conference at Lake Success, which could well serve as a text and guide for future planning of this industry. It is also enlightening to executives and supervisors active in this industry but who may not be so well informed on the scientific advances made in their own industry in recent years.

The UN conference was on "Conservation and Utilization of Resources." Dr. Holzer, in effect, was "spokesman" for the North American industry and in his address he presented an authoritative evaluation of the progress this industry has made in more efficient wood use and also in the utilization of waste liquor.

After making his thorough-going and very informative talk in Lake Success, N. Y., before government and technical men from all over the world, he hurried back to his home in Camas, Wash., to complete his work as program chairman of the meeting just two weeks later in nearby Portland.

Dr. Holzer, in his paper, said the pulp, paper and board industry, which is the largest one using wood as a chemical raw material, is, in securing its supply, actively participating in a program to prevent depletion of this natural resource, and to extend the usefulness of wood through preparation of by-products. Wood species in every section of the country, which have hitherto been considered unsatis-

factory, are being converted into products of good quality. The yield from wood is being raised where the product is able to absorb pulps of high yield type.

The non-fibrous residue of the pulping processes are being intensively studied as raw materials for the chemical industry, he said.

He started off his report by recalling the 1926 and 1927 Hodgson reports published in **PULP & PAPER** which showed 42 cords per acre, cordwood size and larger, left over on Pacific Northwest logged-off lands because of economic factors, lack of proper equipment and terrain difficulties. He said new mechanical equipment and methods in pre-logging and re-logging have reduced this waste to as little as four cords per acre. He told of vast loss of wood because of overcrowding and how thinning now brings out young wood suitable for pulpwood. He cited decaying, over-mature forests and how these can be used for pulp, although yield may be slightly lower and production lower by as much as 25% because decay lowers wood density in digester charges.

One of the most critical problems, said Dr. Holzer, "is that in every section except the Northeast the cut of softwoods exceeds the growth, and in that section much of the new growth is difficult of

MORE THAN 550 DELEGATES AT LAKE SUCCESS

Men from this industry played prominent parts in the first United Nations Scientific Conference on the Conservation and Utilization of Resources held at Lake Success, N. Y., Aug. 17-Sept. 6.

Although the conference, which brought literally hundreds of participants and observers from many countries, covered the whole range of conservation and utilization, the meetings of chief interest to the wood-using industries took place Aug. 29 and 31. These were on techniques of forestry and utilization of wood.

Industry men invited to participate included Dr. Walter F. Holzer, Central Research Department, Crown Zellerbach Corp., Camas, Wash.; Clark C. Heritage, technical director, Weyerhaeuser Timber Co., Longview, Wash., which makes pulp and board; M. H. Collett, assistant to the vice president, West Virginia Pulp & Paper Co., New York; and George L. Drake, manager of the logging division of Simpson Logging Co., Shelton, Wash., which has a fiberboard plant.

More than 550 technical men attended from about 40 countries.

In the chemical utilization of wood discussions, in addition to Dr. Holzer's paper, there was "A Study of the Chemistry of the Sulfate Process" by Erik Hagglund, Swedish Wood Pulp Research Institute (first published in **PULP & PAPER**, page 50, May 1949 issue). Mr. Heritage's material on wood waste was assisted by a panel which included Alfred J. Stamm, U. S. Forest Products Laboratory, Madison, Wis., and Edward G. Locke, chief of forest utilization service, Pacific Northwest Forest and Range Experiment Station, Portland, Ore.

U. S. inventions were initiated through the office of the secretary of the interior. After the conference a number of delegates embarked on a Congress-sponsored tour of eastern U. S.

Feelings as to the results of the big get-together were mixed, but the majority appeared to feel that in its very hugeness it failed in some respects. In the time allotted, speakers had to be brief and also mindful that many of the foreign representatives had little background, as yet, on mechanization. Those who came with experiences to tell did not always have a chance to tell their whole story. No observer could fail to note the infinitesimally small percentage of industry scientists in comparison with the technical men from governments and institutions.

During general discussion, A. B. Recknagel, director of forests of the St. Régis Paper said he believed that the "enlightened self-interest" of the men in the paper industry made them the best conservers of timber. Their profits over a long-term were entirely dependent on the wisdom of the timber policy used in the regions they owned, he said.

access and comprises balsam fir, a short-lived species that cannot be recovered efficiently, so that even here the desirable softwoods are disappearing."

This has accelerated the use of hardwoods except in the Northwest, he said.

"Commercial application of many published suggestions has resulted in continually increasing volume of hardwood usage," said Dr. Holzer. "In varying extent almost every known pulping process is applied commercially to hardwoods." His comments on each process follow:

1. *Soda*—because of low yields and strength this process is confined to relatively small quantities of filler pulp, and there are no signs of expansion.

2. *Groundwood*—particularly well suited to soft-textured aspen and use is expanding. The harder and denser hardwoods produce a dark pulp which is weak and full of shives because of fiber damage in grinding.

3. *Kraft*—used to produce pulp both at high yields for board, and at normal yields for paper. Hardwoods are admirably suited for high yield board pulps because their short fiber and low lignin content make them easy to defiber, and their high hemicellulose adds stiffness to the board.

4. *Sulfite*—usually used for paper-making pulps, and best suited for aspen. It is sometimes used in high yield cooking with chemical purification to preserve hemicelluloses for extremely fast beating.

5. *Neutral sulfite*—particularly useful on hardwoods and especially at high yield because of its specific action on lignin and mild action on hemicelluloses. Its slow action is compensated by the low lignin content. Pulps can be used either at high yield for board, or can be purified for papermaking. Although the former predominates, the strength of the latter is as good as from softwoods. The principal disadvantage of the process is lack of suitable chemical recovery.

"In the Pacific Northwest the greatest species change in pulpwood usage in the last decade has been the utilization of Douglas fir," he said. "This is primarily a lumber tree, but its stands are so preponderant in that region that consumption of its low grade wood in pulping is necessary. This species cannot be pulped by the sulfite process because of a flavanone material in the heartwood, but is readily cooked in the kraft process. Aside from the over-mature logs, wood of this species available for pulping includes sawmill waste, and small trees from new stands too small for lumber. These latter make the best pulpwood, and because of their small heartwood content are being used successfully in groundwood, for which the older wood is unsuited. In addition to being a major raw material for the kraft pulp industry in that section, it is supplying an expanding insulating board industry.

Lodge-pole pine

"The extensive stands of lodge-pole pine between the Cascade Mountains and the Rocky Mountains have seen little commercial use. Although it has been known for some time that a good kraft

HERE ARE FACTS YOU SHOULD KNOW

The whole range of recent developments in closer wood utilization, involving new logging as well as new pulping processes, and also all the developments in the utilization of waste liquors and of the use of lignins in both sulfite and kraft processes were reviewed in the address which Dr. Walter F. Holzer, assistant director of research, Crown Zellerbach Corp., made before a United Nations meeting, as reported in this article.

He discussed ammonia base sulfite systems in Maine and Washington mills and the magnesia base system being tested at Weyerhaeuser's Longview, Wash., mill and many other recent developments in the industry.

His review—and more important, HIS EVALUATION of all these developments—should be well known to every employee of the North American pulp and paper industry. Certainly, every executive and every supervisor should know these facts and for that reason we have liberally quoted from Dr. Holzer's address in this article. They should know these facts about the many constructive steps taken by this industry in an effort to solve its problems so they can talk intelligently about them. They are the "voice" of the industry to the men who work under them, and to their neighbors and community club associates—many of whom hear only a distorted, politically-inspired version of these matters.

Dr. Holzer, who is now the No. 1 man in this industry's technical division on the Pacific Coast, as its chairman, was more than that at Lake Success—he was spokesman for the entire pulp and paper industry.

pulp could be made from the wood, transportation has been too high to allow this specie to compete with more favorably located supplies.

"The consumption of these species which were formerly ignored reduces the drain on standing timber reserves, and will permit the foresters to expand the stands of the more valuable softwoods, which in some sections are critically short."

New Pulping Processes

In discussing increase of yield by means of pulping processes, Dr. Holzer reviewed processes especially for the various types of boards:

1. *Asplund process*. Developed in Europe, consists of steaming chips until the lignin is plastic, then with the chips still under full steam pressure, disintegrating them in a disc type refiner. By adding a reaction chamber the chips can be given prolonged treatment. Pulp yield can be adjusted between 90% and about 60% depending on hardness desired.

2. *Neutral sulfite process*. Principle used by Cross and Bevan, but commercial process not developed until about 1925. A single mill made pulp from softwoods for about ten years. Revived recently for semi-chemical work especially on hardwoods. Neutral sulfite has rather slow action on lignin, which preserves the hemicelluloses. Good semi-chemical pulps at 80 to 85% yield are made. Commercial usage ranges from 7.5 to 15% on weight of wood depending on degree of cooking desired, cooking temperatures range up to about 170° C. and cooking time from 2 to 6 hours. Exceptionally good strengths of pulp; much lighter than kraft pulps, and much more easily bleached.

3. *Refining in hot kraft black liquor*. Same principle as the Asplund, that of defibering partially cooked chips while lignin is in a plastic state; developed in an eastern Canadian mill. Kraft pulp is cooked raw, to yield 55 to 60%, blown, diluted with hot black liquor to about 2.5%, and defibred in disc refiner. It is claimed test liner board made from high-yield pulp is as strong or stronger than from normal paper pulp.

Use of Liquors

"In 1947 sulfite pulp production in U. S. was 2,792,000 tons and kraft 5,276,000 tons, a total of 8,068,000 tons," he said. "In round figures this means that 4,000,000 tons of lignin and 2,000,000 tons of carbohydrates were contained in the waste liquors." Dr. Holzer said: "Thus far the only use which could approach a universal solution has been concentration and burning of the liquor to recover heat values and cooking chemicals. While this is an answer to utilization, it represents only a low value of recovery."

Sulfite mill alcohol plants in America, he pointed out, have two competing processes, fermentation of molasses, and synthesis from hydrocarbons, both of which can produce more cheaply. He mentioned the three plants in North America—Gatineau, Que., Thorold, Ont., and Bellingham, Wash. One Canadian plant is making vanillin as a second product, and Puget Sound Pulp & Timber Co. is marketing dried calcium lignosulfonate under the name of lignosite as a dispersing agent for cement.

He cited the co-operative venture of the sulfite mills of Wisconsin, the first pilot plant of commercial size at Rhinelander, Wis., to utilize liquor from 5 tons of pulp a day, designed from, but improved over, the Waldhof process in Germany, and growing *Torula utilis* yeast. He said its greatest consumption as a stock food would probably be in the northeast and Pacific northwest states where vegetable protein feeds are insufficient.

He said the first commercial recovery of calcium lignosulfonate was by the Howard process in operation in Rothschild, Wis., since 1936. Products are vanillin and derived phenols, tanning agents, dispersing agents, and chemicals for boiler water treatment. Expansion of this process has been limited by the fact that one mill supplied the market. He listed other suggested uses for sulfite waste liquor, few of which have achieved any significance:

1. Adhesives—principally linoleum cement
2. Core binder in foundries
3. Soil conditioner
4. Soil stabilizer for roads
5. Carrier for insecticides
6. Emulsions

Other Bases Than Calcium

"Regarding use of other bases than calcium, which hinders evaporation and burning, he said now two mills in the U. S. use ammonia base and one is starting use of magnesia.

"There are no reports that the change of base has caused any outstanding change in cooking or in pulp qualities," he said. "The use of a soluble base permits evaporation of the liquor, burning for heat recovery, and in some cases recovery of the cooking chemicals. Enough heat is generated in burning to evaporate the liquor and cook the pulp."

"A unique feature of the magnesia base liquor (see description of Weyerhaeuser Longview, Wash. plant, Nov. 1948 PULP & PAPER) is that magnesium oxide and sulfur dioxide are formed quantitatively and can be recovered in a cyclic process," continued Dr. Holzer. "Sulfur dioxide can be recovered from burning of ammonia-base liquor, but it is doubtful whether significant quantities of ammonia would be found. It has been proposed that ammonia-base liquor could be evaporated and sold for fertilizer because of its nitrogen and humus contents."

"The lignin in the black liquors from kraft or soda pulping is, with the exception of three

mills, burned to recover chemicals and heat," he said. "Two soda mills and one kraft mill recover part of the alkali lignins by precipitation with carbon dioxide from flue gases. The soda alkali lignins come almost entirely from hardwoods, whereas the kraft come largely from softwoods and contain about 1.5 sulfur. The uses are similar.

"One use is as an impregnant of paper with lignin precipitated on the fiber in the beater," he said. "The impregnated paper has about 10% of phenolic resin added. Sheets are laminated in a hot press.

"In their present state of development, lignin moulding powers are of low quality. Color is dark brown to black, molding conditions are severe, strength only fair, and moisture resistance low. At best they are a diluent and extender for more expensive resins.

"An unusual use of soda lignin for which it seems specifically adapted is as an organic expander for the negative plate of a lead-acid storage cell," he said. "It is almost universally used in all batteries now manufactured in U. S."

He mentioned other applications where alkali lignin has met some success:

1. Lignin ethers are good film formers in protective coatings.
2. Lignin stearate is a mold lubricant.
3. As a dispersing agent in asphalt emulsions.
4. To reduce cold flow in asphalt.
5. As a substitute for carbon black.
6. As a base exchange material.
7. As a boiler water treatment.

"But as under lignin sulfonates no use has been found for alkali lignins which would require more than an insignificant percentage of the amount available," he said. "When we consider that the results in utilization of lignin by-products are so meager as to be disappointing, the need for fundamental research on lignin is brought out in bold relief. Two groups of mills, one in the state of Wisconsin, the other in the state of Washington, are sponsoring fundamental research on lignin."



DONALD R. DICK, Supt.
Paper Mills, Howard
Smith Paper Mills, Ltd.,
Cornwall, Ont., elected
Chairman of Canadian-
N. Y. Supts. Division,
largest of all divisions.

Canadian-N. Y. Supts. Hold Plattsburg Meeting

A highly successful meeting of Canadian and New York State superintendents took place Sept. 8-10, at the Hotel Champlain, Plattsburg, N. Y., under chairmanship of the following: J. O. Julson, The Diamond Match Co.; D. R. Dick, Howard Smith Paper Mills, Ltd.; C. E. Cole, The Mutual Boxboard Co.; E. C. Keyser, Diamond Match; and H. A. Horstmann, General Dyestuff Corp.

Mr. Dick was elected chairman; H. S. Cutler, United Board & Carton Corp., was elected first vice chairman; C. E. Cole, second vice chairman; and F. A. Dieckbrader, Hinde & Dauch Paper Co. of Canada, Ltd., third vice chairman.

Principal speakers were Allen A. Lowe, Sandy Hill Iron & Brass Works, on "Elements Controlling Formation of Paper in Cylinder Vats"; E. Glauner, Downingtown Manufacturing Co., on "Securing Extractor Roll on Tissue"; Carleton Clark,

MgO FIGURES ANNOUNCED; More Work Must Be Done

(Editorial)

For the first time since the revolutionary magnesia base sulfite pulp recovery system started up at Weyerhaeuser Timber Co's Longview operations in late 1948, official figures on the crucial chemical and heat recovery results have been made public.

This was perhaps the most significant single scientific development in the technical sessions in Portland, Ore.

But it would be a grave disservice to the sulfite pulp industry in general if, in any of the publicity or discussions emanating from that meeting, these figures were accepted as conclusive or establishing a sound economic justification for the new process.

Ray Baker, manager of the Longview pulp operations, who announced the figures, made it crystal clear that they were not yet satisfactory and said that "steps are being taken now to increase chemical and heat recovery." He said part of these losses result from carryover in evaporators, and also "chemical losses in washed pulp are somewhat higher than anticipated."

The confidence of the Weyerhaeuser management in their new process is greater than ever, but these Weyerhaeuser men would be the first to disclaim any idea that they have yet got what they want for an end result.

Figures announced by Mr. Baker were for August 16 to 22, "a typical week," and they were:

74% recovery of MgO.

64% recovery of sulfur.

This is substantially below recovery they are aiming for.

Per airdry ton of sulfite pulp, chemical usage averaged 103 lbs. of makeup sulfur; 49 lbs of makeup MgO or 44 lbs. of pure MgO, which are higher figures than they expect to get.

As for heat recovery, he announced 4,350 BTU's per lb. of liquid solids fired. He announced 5,770 BTU's per lb. of liquid solids were expended into "useful work."

The announcement of these figures at Portland was an unselfish contribution to the general welfare of the industry by Weyerhaeuser. There is no doubt it will now stimulate further intensive work in this field.

Here are now figures for all to see and for the pioneers who are working on this process to shoot at.

More power to them—but meanwhile, let none come forward with any cry that this expensive system has been proved and should forthwith be installed in other sulfite mills which are equally concerned with trying to find a solution to their problems.

When there are more figures to be announced at Longview, they will be published in this magazine.

Clark and Vicario, on "Water Removal by Vacuum at the Wet End"; Basil Rogers, Staebler and Baker, Ltd., on "The Howard Smith Creaser." A number of lively forums were held in paperboard and felt, fine paper and tissue, and kraft and groundwood specialties.

Consolidated Launches New Advertising Program

Launching of a greatly expanded national advertising and merchandising program to promote Consolidated Enamel Papers is announced by Walter L. Mead, vice president in charge of sales, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis. Sales headquarters are at 135 South LaSalle St., Chicago. Full page 4-color ads will appear monthly in Fortune and Business Week, with black and white pages in several others. The new campaign by Christiansen Advertising Agency, Chicago, will inform users of commercial printing how to save 15% to 25% in printing costs, while maintaining high quality printing standards. Consolidated Enamel Papers used by Life,

McCall's, Vogue, Fortune, Time and other magazines, are produced fully coated on both sides in a single, continuous, high speed operation on the paper machine.

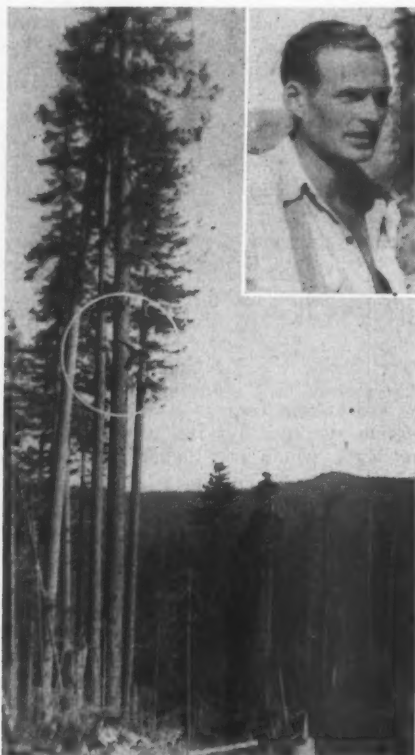
F. Harold Murtfeldt, recently appointed advertising and sales promotion manager of Consolidated, says that large scale merchandising plans call for careful development of the commercial printing field. Consolidated has patent infringement suits pending against Kimberly-Clark Corp. and the The Mead Corp. relative to the coating process.

New Pulp Operators Buy Paper Company

Smith, Davidson & Wright, Ltd., of Victoria, Nanaimo, Calgary and Edmonton, one of the largest wholesale paper houses in Western Canada, has been purchased by the H. R. MacMillan Export Co., builders of the new Nanaimo, B. C., kraft pulp mill. Fred Smith of Vancouver, who founded the paper company, continues as president. John Lecky, son-in-law of Mr. MacMillan, is general manager.

DESCRIPTION OF OUR COVER PICTURE

Our cover picture this month has transfixed that one moment of the Portland Technical Convention which probably was the biggest thrill of all for the greatest number of delegates — certainly those who came from Florida and Maine, Mexico and Australia and many others who had never had the experience of witnessing a high climber go up a giant Western tree to chop and saw off a top several times as thick thru as himself, and then come racing back down 200 ft. or more like a monkey.



Here is shown another picture of the same tree taken as World's Champion High Climber, Harold Johnson, was going up it. And in the inset is a photo of young Johnson. Just a few weeks previously had won his world's title by racing up a tree, topping it at 100 ft. height and 14 inches diameter and racing down again in 3 min. 12 sec.

In this performance high up in the St. Helens mountain slopes on Weyerhaeuser Timber Co.'s St. Helens Tree Farm, he is shown topping even a bigger tree.

Only the rope around the trunk of the tree and himself (a rope he must repeatedly loosen and move as he climbs up) plus climbing irons strapped around his legs, stand between the daring high climber and eternity. And when that top fell, as shown in our cover picture, the rest of the great tree swayed as though it were being uprooted by an earthquake and he hung on for dear life.

They say an easy way to lose a bet against a high climber is to lay the money at the foot of the tree, then stand 200 ft. away — on the ground — or as many feet as the high climber is at the top of his tree stump — and race him to the betting money!

ONE TREE will make a million matches — one match will burn a million trees.

THE FARMER is the principal owner of forest lands in America today.

THERE ARE more than 4,000 uses of wood today.

WOOD PULP is the basis of 95 per cent of all paper.

PEOPLE cause most forest fires.

ONE OF GREATEST SHOWS THIS INDUSTRY HAS SEEN — WEYERHAEUSER'S WOOD TRIP

Weyerhaeuser Timber Co. put on one of the greatest shows ever seen by the paper industry when it played host to 235 delegates of the Portland convention Sept. 12 on a day-long trip high up in the deepest forests of the Cascade Mountain range.

It was a trip and a show the participants — including industry men from Maine to Florida and to California, and from Canada, Mexico and Australia — will never forget as long as they live. From every point of view, educational to sensational, it was the high point of the convention and many of the delegates who failed to rouse themselves in time for it will long regret it.

It was a 50-mile trip to Longview and then 25 miles up in the woods on the north fork of the Toutle River on a fleet

VIEWS ON THE LONG-TO-BE-REMEMBERED WEYERHAEUSER WOODS TRIP:

Top: High lead logging demonstration with snow-capped Mt. St. Helens as a majestically glorious backdrop.

Left center: A big fir falling — caught at 1/100 of a sec. by PULP & PAPER on 35 mm. film, as were many others of these exclusive photos.

Lower left: Paul Preston, High Climber, who cut off

of eight buses. The weather man co-operated by providing a clear sunny day with a magnificent backdrop for each and every logging and woods scene with snowcapped Rainier, St. Helens, Adams and Hood looming up clearly time after time.

The climactic events were when two championship tree toppers, Harold Johnson and Paul Preston, climbed 170 to 200 ft. up two trees, cut off the tops, giving their audience a thrill by hanging on as the trees swayed wildly and the tops fell with a crash, then climbing on the stump 200 ft. above the ground and all but doing a jig on it, and racing back down like monkeys. There were also demonstrations of the Disston two-man chain power saws now used in the woods by Weyerhaeuser, and the loading and logging of giant logs.

They saw five logs weighing 45 tons

about a 50 ft. dead top from a giant fir and then climbed on the stump to thrill the spectators.

Right center: Heel-and-boom loading of giant trimmed trees.

Lower right: Howard Morgan, Manager of the Pulp Division, and Harry Morgan, Manager of Longview Lumber Division, who are not related, but are both Weyerhaeuser Timber Co. top officials who took a leading part in arranging the woods trip.



One basic fact was driven home time and again—that logging today as practiced by Weyerhaeuser is definitely a science, in every step of it, the eyes of technical men were opened time and again to actual “pilot plant” growth and cutting sections which were just a clump of trees to them before they were told what was going on.

The International Brotherhood of Migratory Peddlers staged one of their best shows yet for the "Wake 'Em Up Breakfast" at the Portland convention.

Despite the raucous nature of these initiations there is a serious tribute implied to the honorees for their support of cooperative activities and good fellowship and good citizenship in this industry.

A black and white portrait of a middle-aged man with a receding hairline, wearing round-rimmed glasses, a dark suit jacket, a white shirt, and a patterned tie. He is looking slightly to the left of the camera with a neutral expression. The background is a light, textured surface.

The map is a hand-drawn geographical representation of the Longview area. It features several rivers: the Toutle River flowing from the top left, the Salmon Creek flowing into it, the Silver Lake flowing into the Toutle, the Cowlitz River flowing from the bottom left, and the Kalama River flowing from the bottom center. Key locations marked include Toledo at the top left, Camp 9, Camp 10, Camp 7, Camp Baker, Al Raught Park, Castle Rock, HEADQUARTERS CAMP, Camp 5, and Spirit Lake on the right. The map is divided into sections labeled with growth stages: 'LARGE SECOND GROWTH' at the top, 'YOUNG SECOND GROWTH' in the center, 'SEEDLING' in the lower left, and 'OLD GROWTH' along the right and bottom edges. A flag is depicted on the Cowlitz River near Longview. A small illustration shows a tree falling with the text 'TREE FALLING' and 'TREE TOPPING' nearby. A circular stamp on the right reads 'CMT ST. HELENA 1967'. A scale bar at the bottom indicates distances from 0 to 5 miles.

Some of the gags:
Harris Fenn, unquestionably a tall guy, introduced as "Big Chief Low pH" and Ernie Kertz, who looks up to him, as "Little Chief High pH."

For Mr. Bachmann—"We couldn't get you a piece of pipe so here's a piece of pipe to use on your competitors." And they put the "double-cross" sign in lipstick on his forehead.

When Mr. Smythe took off his cowboy hat, that "Chemtone finish" was explained as result of an Indian scalping.

Chief SOB-Slobbering Old Buffalo (Ben Natwick) "straight from the reservation — the reservation committee, that is."

"If you can see Mt. Hood, it's gonna rain; if you can't, it's raining."

A get-together of IBMP members followed the show, with "Waiting Rooms" in other sections of the country. Speakers were Sax Fletcher of New York; Olin Callighan of Kalamazoo; Bill Stitt of Memphis and Larry Smith of Seattle.

WAITING ROOM NO. 1 (Portland, Ore.) of the International Brotherhood of Migratory Peddlers staged a colorful breakfast show at the National Technical convention when they initiated Al Bechmann, National President of TAPPI, as an honorary member with title "Big Chief Strike 'Em Lucky."

At top l. to r.: Mr. Bachmann, wearing his new headdress and a huge Portland rose; Buff Natwick, the musical director; Ben Natwick, "Chief Slobbering Old Buffalo;" Roy Shanaman, "Princess Sitting Pretty," and Sid Drew, the Camp Cook, sweeping up.

Below is a general view of performers with Al Bachmann in business suit.

The three at microphones l. to r.: Zinc Wise, "Pony Boy Slim;" John M. Fulton, "Cactus Jack;" and Ray Smytha, "Curly."



SALUTE TO A JOB WELL DONE



HERE ARE THE HARD-WORKING CHAIRMEN who staged one of most highly successful conventions this industry has seen in the National Technical Fall Meeting in Portland, Ore., in mid-September, which drew an attendance of nearly 800.—Photo by PULP & PAPER.

Front row, l. to r.: Dr. WALTER F. HOLZER, Assistant Research Director, Crown Zellerbach Corp., Camas, Wash., Chairman of the Coast host section and Technical Program Chairman; HOWARD W. MORGAN, Mgr., Pulp Division, Weyerhaeuser Timber Co., Tacoma, Wash., Chairman of Woods Trip, a spectacular show; A. G. "Buff" NATWICK, Asst. Res. Mgr., Crown Z., Camas, Wash., and RUSSELL J. LE-ROUX, General Convention Co-Chairmen; JOHN M. FULTON, Mgr., Pacific Coast Supply, Portland, Local Transportation Chairman; GUS OSTENSON, Mgr. of Paper Mfg., Crown Z., Camas, Mill Visits Chairman.

Back row, l. to r.: Z. A. WISE, Vice Pres., Griffith Rubber Mills, Portland, Publicity

Chairman; MILTON J. MAGUIRE, Res. Mgr., Hercules Powder Co., Portland, Co-Chairman of Registration, Housing and Food, whose smooth, efficient handling of a tremendous job won much acclaim; ROBERT M. TRUE, General Dyestuff Corp., Portland, Sec.-Treas. of host Coast section and Convention Finance Chairman; LEROY M. SHANAMAN, District Sales Mgr. of Penn Salt Mfg., Portland, Chairman of a smash-hit Golf Tournament, which drew 100 participants; RAY SMYTHE, Rice-Barton and Heppenstall rep., Portland, General Entertainment Chairman, who arranged several Class A events with a final show that ranked with the very best that anyone could see on Broadway; and BEN E. NATWICK, Appleton Wire Works, Camas, who shares laurels with Mr. Maguire as Co-Chairman of Registration, Housing and Food. Unable to be present were H. A. "GOB" DES MARAIS, General Dyestuff, San Francisco, who headed Reception Committee and met delegates at Sun Valley, and ROBERT S. WERTHEIMER, Vice Pres. and Res. Mgr., Longview Fibre Co., Longview, Travel Chairman.

For a remarkably well done job in staging a national industry convention, hats off to this committee and their groups of hard-working assistants! It is seldom that this industry has ever seen a convention so smoothly and professionally run, with every event run off like clock-work, as was the case in the big Technical Fall Meeting at Portland, Ore., Sept. 11-15.

More than 700 registered in attendance spent an interesting and highly enjoyable get-together. From the time the special train left Chicago on Sept. 8, until the last note of music was struck early in the morning of Sept. 16, there was not a single hitch of serious consequence. The comfort and convenience of the guest delegates was superbly provided for, at all times. The Pacific Coast section—in only the third chance that it has had in the industry's history—met the test put to it with a most carefully planned and engineered program of arrangements in every detail.

Within actually a very few minutes from the time they landed in Portland, most delegates were comfortably in their rooms, the several participating hotels cooperating loyally with the committee. The ladies were provided a round of entertainment—golf, fashion show, teas, luncheons, bridge,

Attendance and Participation

Actual registration for the Portland, Ore., technical convention was 725. Further reports may show this to be the biggest industry meeting of its kind ever held outside of New York.

About 485 were men. A total of 240 came from east of the Rockies, most equipment men; the rest from the Pacific Coast. On the special train were 107. Preponderance of Coast mill men gave the mill men a total edge over the equipment men of about 3 to 2. A later check on this will be published.

The sensational woods trip was enjoyed by 235 who boarded buses at 7:30 a.m. Many "sleepers-in" were sorry when they heard about it. About 150 made the mill visits, while 100 competed in golf on the same day. But after the convention about 40 more went north to visit Washington state mills.

two nights of dancing and entertainment, and a Mt. Hood trip, and for the men there was one of the finest technical programs ever given, completely devoid of "puff" papers and a well-rounded review of industry development, as well as a sensational woods trip, and mill visits in which there was a high percentage of participation.

Under co-Chairman A. G. Natwick and R. J. LeRoux, here are the convention committees who did the job:

Technical Program—W. F. Holzer, chairman; R. I. Thieme, H. C. Wall, H. W. Bialkowski, J. L. McCarthy, O. H. Sangder, E. O. Ericsson and H. F. Lewis.

Publicity—Z. A. Wise, chairman; H. H. Richmond and L. K. Smith.

Travel—R. S. Wertheimer, chairman; J. A. Foxgrover.

Woods Trip—H. W. Morgan, chairman; H. E. Morgan and C. A. Corman.

Registration, Housing, Food—M. J. Maguire and B. E. Natwick, co-chairmen; H. W. Beck, T. D. Johnson, Jr., C. S. Reppe and W. A. Salmonson.

Finance—R. M. True, chairman; A. G. Natwick and R. J. LeRoux.

Mill Visits—Gus Ostenson, chairman; C. E. Enghouse, R. T. Baker, Carl Fahlstrom and F. J. Weleber.

Reception—H. A. Des Marais, chairman; Z. A. Wise and J. W. Hemphill.

Local Transportation—J. M. Fulton, chairman; R. T. Petrie, J. B. Sutherland and W. C. Marshall.

Entertainment—Ray Smythe, general chairman; L. M. Shanaman, J. B. Sutherland, D. C. Fulton, F. A. Turner, J. M. Wilcox, E. G. Drew, E. E. Kertz, R. D. Baer, Mrs. J. M. Wilcox, Mrs. L. M. Shanaman, Mrs. James Rubush, Mrs. Erik Ekholm and Mrs. D. J. Keating.

Women's Tea—Mrs. R. J. LeRoux, chairman; Mrs. R. S. Wertheimer, Mrs. Marvin C. Jones, Mrs. Walter F. Holzer, Mrs. Howard W. Morgan, Mrs. E. J. McGill, Mrs. Erik Ekholm, Mrs. Max R. Oberdorfer, Mrs. W. E. Breitenbach, Mrs. M. J. Otis and Mrs. C. E. Braun.

MANAGEMENT GIVES GUIDANCE PORTLAND MEETING

A distinctive feature of the national technical convention of this industry which brought nearly 800 delegates and guests to flowering Portland, Ore., and the scenic lower Columbia River pulp and papermaking country in a sunny and glorious mid-September was the prominent part taken by top flight management executives.

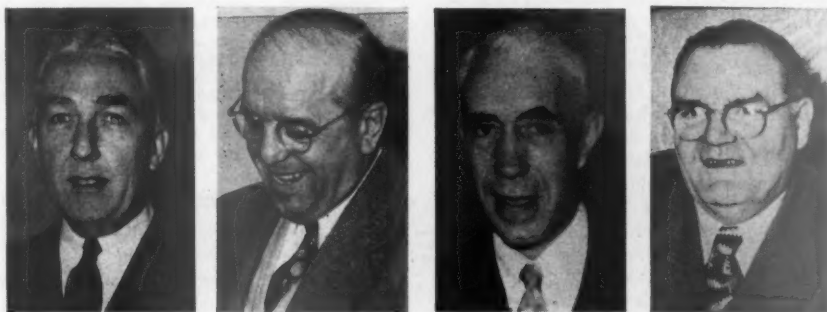
They gave guidance and valued advice, gained from a broad perspective of the industry and its problems. Their words fell on eagerly attentive ears of technical men, research men, superintendents, engineers, equipment and mill supply men—all anxious for inspiration and counsel from their experienced leaders in this period of shifting economic and political conditions. Unquestionably, this contact between management and the TAPPI group was the chief benefit derived from the meeting which brought delegates from all corners of the continent.

Men like Harold S. Foley, the forward-looking national chairman of the Canadian Pulp and Paper Association and president of Powell River Co.; Lawson T. Turcotte, aggressive president of the Pacific Coast Association of Pulp and Paper Manufacturers and executive vice president of Puget Sound Pulp & Timber Co.; Col. Alexander R. Heron, erudite chairman and spokesman for management in the annual wage negotiations for all U. S. Pacific Coast mills and vice president of Crown Zellerbach Corp., and E. W. Tinker, hard-working executive secretary of the American Paper and Pulp Association, were featured speakers.

Devaluation and Turcotte

In view of the dark cloud of European currency devaluation which, only a few days after the convention, became an ominous reality—laying a cold, clammy hand over the North American pulp industry—what speech could have been more timely than the forthright, revealing discussion of our international policies by Mr. Turcotte? He used facts and figures in challenging the platitudes of so-called statesmen.

Now that devaluation has come, Mr. Turcotte's address, in which he cut through the hazy web of untruths and unrealities that go to make up so much foreign policy propaganda by the U. S. State Department as well as abroad, is of even more vital significance to every person who earns his living directly or indirectly in this industry. And in view of the fact that the last time devaluation occurred, it greatly imperiled our pulp industry, which became so vital to our national safety in 1941-45, his words have meaning for every local citizen. He pointed out how the pulp and paper industry has already been the No. 1 giver



MANAGEMENT MEN PLAYED A LEADING ROLE at Portland—giving eagerly-heard advice to technical men and other delegates in these days of changing political and economic conditions. Here are some who took a leading part (left to right): HAROLD S. FOLEY, Chairman of Canadian Pulp & Paper Assn. and President of Powell River Co.; LAWSON TURCOTTE, President of Coast Association of Pulp & Paper Mfrs. and Exec. Vice Pres. of Puget Sound Pulp & Timber Co.; COL. ALEXANDER R. HERON, Management Spokesman and Leader in Coast industry-wide labor negotiations and Vice Pres. of Crown Zellerbach, and AL BACHMANN, President of TAPPI, who is also a management man—Vice President and Mill Mgr. of Missisquoi Paper Corp. in Vermont.

or goat or guinea pig of all industries in the sacrifices made here to create foreign dollars! But more about his speech later in this article—

Tribute to Growing Far West

Incidentally, the selection of Portland,

Ore., for such a national convention, marking only the third time it has been held on the Pacific Coast, was an implicit tribute to the phenomenal growth of the industry in the Far West—where there has been the greatest and most rapid influx of population in recorded world his-

EXPERTS REVIEW TECHNICAL SESSIONS IN PORTLAND FOR PULP & PAPER READERS

Convinced that there is a place in the literature of this industry for authoritative appraisals as well as reviews of the studies and the discoveries which are presented at technical meetings, PULP & PAPER presents on these pages a series of articles which comprehensively sum up and explain the significance of technical papers given at the national technical convention held in Portland, Ore., in mid-September.

Busy management and production executives of the industry have precious little time to wade through technical papers in search of some important bit of helpful knowledge or practical information. And many who may have the time, have not the specialized training to enable them to evaluate these technical papers.

To do all this for them—in language understood by every management and production executive from presidents and chairmen of companies to the superintendents and supervisors—PULP & PAPER has engaged three experts in their fields. They are not only superbly qualified as research men to appraise these papers—they have also been close to actual operations in mills and speak the language of the supervisor and the operator.

It would seem to be especially desirable for this magazine, PULP & PAPER, to present these unusual articles, because the readers of PULP & PAPER are the management, production and supervisory men of this industry from coast to coast, and from Newfoundland to Mexico.

For the purposes of this presentation, it was fortunate for PULP & PAPER and its readers that one of the largest and most diversified paper companies in the world has its own Central Research Department at Camas, Wash., just 24 miles from the convention. And also here are men who are close to the practical operations of one of the most diversified and largest quality and specialty mills in the world—the Camas mill of Crown Zellerbach Corp. For these reasons of proximity, diversified background and training, and affiliation with an outstanding research body, we selected our three authors from this Central Research Department.

Dr. John S. Barton, supervisor of paper products development, who received his doctorate in organic chemistry at the Institute of Paper Chemistry, reviews and appraises the papers on (1) Papermaking and (2) Fundamental Research.

Dr. Kenneth G. Booth, who is in charge of experimental pulping in the Central Research Department, and who obtained his doctorate at McGill University in cellulose chemistry, reviews and appraises the papers on (1) Sulfite Pulping and (2) Pulpwoods.

James H. Hull, a bachelor of science in chemical engineering at the University of Washington, now in charge of process development in the Central Research Department, after 16 year of mill operation and research experience, reviews and appraises the papers on (1) Engineering and (2) Alkaline Pulping.

We are sure that you will not want to miss this unusual approach to, and method of, reporting a technical meeting in this industry and recommend that you read these articles.

And if this method of covering a technical meeting is of value to you, or just of interest to you, we'd like to hear from you about it.

THESE ARTICLES BEGIN ON PAGE 42.

tory. This great migration, far surpassing anything recorded in Biblical, ancient, medieval or modern times, has been accompanied by the building of no less than 58 pulp and paper mills, including several of the largest in the world, and the appearance of a large number of converting plants of all kinds on the Pacific Coast.

Foley on Technical Language

Mr. Foley, in the first luncheon address, identified the "spirit of freedom and intelligent cooperation" among even the "competing elements in this industry" with "the system of free enterprise" and he showed how both have brought growth and prosperity to the entire industry. He contrasted this with the "Iron Curtains" which prevent similar sharing of experience and ideas in "most other industries on this continent."

Mr. Foley used a figure of speech in advising technical men to develop "a speaking acquaintance with the sales and accounting departments" of their companies and to "be able to present your ideas in words that management can understand."

In these days it is even more important than ever to have ideas that "are commercially sound," he said, and he also urged them to "be jealous of your freedoms and your responsibilities."

The final important portions of Mr. Foley's talk follow:

"Virtually every company today is, or should be actively engaged in tightening up, overhauling their affairs, and taking stock, because our system of free enterprise is being challenged. We are out of the period when any type of an operation could produce and sell any kind of a product, and make a profit. To be able to operate profitably in this period of price adjustment and reduced volume, management, with your help must cut costs and be able to sustain a reasonable volume."

"Today we must trim our sails to the winds of readjustment for once more we are faced with the homely and simple fact that low costs are an essential part of our system. Low cost production is born on the drawing tables and the testing laboratories of our companies. It is achieved through sound thinking, planning and team work, in every branch of our industry."

"Engineering, design, development, research and management have the perfect opportunity for pooling their talents, if we have any. Each of us should know exactly what the other is doing. By this I mean that through team work we tackle the job in an organized way, bringing out the information needed for far-sighted planning and decision. We need research — not intuition; facts — not fancies. Your groups should present ideas to management in a way that can be clearly understood. Remember always that research and engineering now, as never before, must include as much economic horse sense as it does scientific principle. The movie producers have a name for economic horse sense that sounds good to me — its called 'Box Office Appeal.'"

"In today's modern industrial activity there is no place for the man in an ivory tower — you must contact all departments in the organization for they must have confidence in you and your ideas. The ideas you present must be commercially sound or they are useless to management, whose thinking is obliged to be guided by costs and the resulting profit or loss. Free enterprise thrives on profit — without low costs profit suffers or disappears. Without profit our free enterprise system would soon disappear."

"Research, engineering, operations, sales, finance and management, teamed together under our free enterprise system, will produce an abundance and variety of goods and services on the most economical basis in the world."

Under free enterprise our nations have gone further economically, commercially, politically and spiritually than any others, and have travelled the distance faster. Free enterprise is the seed of future growth for our industry and our countries. It is the great equalizer, giving every man an opportunity to develop his own initiative.

"Your technical knowledge and skill provide what our system grows and thrives on — low cost improvements, new ideas and new developments. The thing that makes men free in our form of society is not wealth, nor is it power — it is knowledge, diligently and intelligently applied. This puts a great responsibility on each one of us and as free men we should be as jealous of our responsibilities as we are of our liberties. This then, is the thought I would like you to take home with you: I am proud of my responsibilities. If I make myself equal to them, they will keep me, my family, my country — free."

Tinker Deplores Industry Ignorance

Mr. Tinker in his final general session address stressed "the impact upon the industry and its personnel of virtually every move made by legislative and executive branches of government" and "as a matter of self-interest" urged the delegates to help "disseminate" knowledge of industry problems.

He deplored the lack of information in Washington about an industry on which "5 to 6 million people in the U. S. are directly dependent" for their livelihood, and 176 towns and cities partly or wholly dependent, and he added it was difficult for this industry to even obtain a hearing in Washington. In remarking about misinformation on this industry, he asserted that there is today not a single pulp-producing company "which is not making plans for a permanent supply of wood to maintain their operations in perpetuity."

He predicted an "inevitable" large increase in the demand for paper in years to come and "charged the Technical Association has a most important function to perform if we are to redeem our responsibility." These include developing new products, extending education, etc., he said.

Colonel Heron's Talk

Colonel Heron, widely known in industry as the management leader and spokesman in pulp and paper's unique labor-management dealings in the Far West, presented at the final luncheon a penetrating and stimulating analysis of what this "management" in industry is.

"Not a few individuals but an institution and a system," he said, and he set forth what to many listeners was perhaps an entirely new concept of the responsibilities and the role of management.

Its great and most urgent responsibility, he said, is selling its goods and services, and it "must enlist every man on its payroll in this selling job—and do it before it is too late."

The "freedom to buy what we please" is becoming almost a unique freedom in this country, but he pointed out how virtually all other freedoms depend upon it, and that once the unions and the workers realize that this is the real job of management, they will cooperate as they never have before and they will come to value and seek to preserve this institution of management. In carrying out

this theme, he pointed out in 1787, 90% of free adult males in America were selling their services or products directly to the users of those products, but in 1949, over 80% of gainfully employed persons are now wage earners on somebody's payroll and they must depend on someone else (management) to do the selling for them.

Colonel Heron called management "the trustee of the national economy" but said "it has failed to tell the truth about this in its labor relations" and "we have allowed ourselves to become involved in debates over cost of living, ability to pay, national wage patterns, fringe benefits, and the ever-present danger of strikes."

"When we recognize that selling is the primary responsibility of management many of our habits and relationships will be changed."

Management Men Top Meeting

While on this theme of management's role at Portland, it should also be pointed out that management men were the top men of the convention. The TAPPI president of this year—Al E. Bachmann, who gave an opening message on TAPPI activities, is now a vice president and mill manager of the Missisquoi Paper Corp. in Vermont. And the two general co-chairmen of the convention are likewise management men—Russell J. LeRoux, mill manager of Weyerhaeuser's pulp mill at Everett, and Albert G. Natwick, assistant resident manager of the big diversified Crown Zellerbach mill at Camas, Wash.

Turcotte's Address

Mr. Turcotte said "it is most important that everyone connected with the pulp and paper industry, including labor, should be vocal with their congressmen and senators in at least retaining the peril point determination in the Trade Agreements act now before Congress. This is not asking much. This provision provides that if you can show injury to an industry, you can get help, and apparently some of our leaders want to kick that out, too."

He quoted figures showing a favorable balance of trade for foreign countries of over 2,000,000 tons in ten years. He showed how pulp importance has increased in ten years, with a favorable balance to foreign countries of \$181,376,123. The favorable balance in paper base stock and paper has jumped from \$175,000,000 in 1939 to \$616,000,000 in 1948.

"I do not know of any commodity which has provided in such a short space of time such an increase in dollars for foreign countries as pulp and paper products," he said.

"I say our industry is entitled to protection from the products of foreign countries with their cheaper labor standards," said Mr. Turcotte. "There seems to be a general misconception that the U. S. is a high tariff country, and this misconception is a matter of propaganda by many foreign countries and, most unfortunately, by our own State Department. In 1948, free commodities ac-

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FROM DISTANT COUNTRIES they came to Portland for the Technical Convention. At top left are two men from Mexico, two from Australia, one from Washington State and one from Vermont—I. to r.: Antonio Sanchez Aldana, Woods Supt. (who attended Santa Clara U. in Calif.) and Victor Vidal, Pulp Supt. and Chief Chemist, both from the Atenquique, Mexico, kraft pulp and paper mill; Dr. Walter Holzer, Convention Program Chairman and Asst. Research Director, Crown Z., Camas; President Al Bachmann of Tappl, who is from Vermont; A. Sloman and J. Cornelius, both from a Tasmania paper mill in Australia. (I. Ichikawa of Japan was another delegate from abroad).

Top to bottom, other views on left side, show: Women getting tickets for their events—

counted for 58½% of total imports for consumption, and of this, pulp and paper led the parade with 10% of the total."

30% Added to Wood Resources

One of the most significant statements made at the convention was Mr. Turcotte's contention that 30% has been added to the raw material of the Pacific Coast industry by technical advances and reforestation policies.

He welcomed the delegates "on behalf of management" and then proceeded to explain the status of the Pacific Coast industry by asking and answering three questions:

"Has our industry on the Pacific Coast kept in step with modern techniques in the use of fibers for pulp, paper, paperboard and other allied products?"

"The answer to this is definitely yes. Technical knowledge has brought to the forefront on the Pacific Coast the use of important new raw materials in the manufacture of pulp for paper, board, and many other fibre products. This is, to my thinking, the most important and far-reaching development over a relatively short period, and has a distinct bearing on long-range operations, stability of employment, and the retention of our American way of life. In a paper presented in this identical city to your meeting in 1934, our western Douglas fir was not considered in the pulpwood figures, nor the cedars, pines, larches, and hardwoods. All of these species are now being pulped to a

Howard Morgan, Weyerhaeuser Pulp Div. Mgr., addressing group on woods trip—Group walking across locks at Bonneville Dam.

Top to bottom on right side:

Vance Reynolds, Puget Sound Pulp (second from left), receiving Shibley Award from Pres. Bachmann. Everett Reichman, Simpson Logging (at left) and J. A. Dykstra, Publishers Paper Co. (3rd from left) were also Shibley contestants—Speakers at first meeting. I. to r.: Dr. H. K. Benson; Wm. R. Barber; Pres. Bachmann; Chairman Walter Holzer; Lawson Turcotte and R. G. Macdonald.

Spectators on woods trip are shown in next two views.

In first one, Mr. Macdonald, holding coat, is flanked by Mill Mgr. Tom Barry, Fraser Paper, Madawaska, Me., and Joe Scheuermann, Cameron, taking movies.

greater or lesser degree on the Pacific Coast, and as time goes on there is no doubt that extension of these uses will be very material.

"Technical know-how has also brought to the forefront a more complete utilization of our Pacific Coast asset, trees. This utilization will, of necessity, vary because of economics, and no doubt in the main the approximately 55% of a tree, not converted to fibrous materials, will be integrated in the pulp operations and used as a fuel and power source, as exemplified by the development of the MgO base for pulping woods, which is another recent outstanding development and, as you know, the first installation is now in operation at the Longview pulp plant of Weyerhaeuser Timber Co. As in all new developments, there are the usual difficulties and delays in arriving at a 100% efficiency of operation, but



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I am sure that Weyerhaeuser Timber Co. will bring this development to a completely successful conclusion.

"There is presently room for some utilization of the part of a tree not converted to fibers, and there have been important developments on the Pacific Coast in the field of converting this former waste to ethyl alcohol and compounds used for adhesives, plastics, and for the construction industry (at Puget Sound Pulp & Timber Co.). This utilization will, in my opinion, expand as our nation and the Pacific Coast area grow in population, with its inevitable drain on some of our natural resources. Tappi members have an ever increasing responsibility to find substitutes for some of these non-replaceable natural resources.

"The ever increasing new uses of fibers in our every day life attests to your vivid imagination, and the transfer of this imagination into action, especially in the paper and board manufactured products, in the field of rayon products, and many other products now considered a necessity in our every day life.

"More in the mechanical technique can be cited; development of new equipment or improvements of older equipment, such as pulpers, defibrators, save-alls, etc., all of which widens the field for use of fibers, and eliminates waste. Probably the outstanding development on the Pacific Coast in this field is the hydraulic barker, which is a relatively new and a proven successful operation, and is now considered a standard installation in all pulp plants on the Pacific Coast. No doubt many refinements and improvements will be made in hydraulic barking of large and small logs, as well as slabs, as time marches on.

"Instrument control in paper and pulp mills on the Pacific Coast is in its most advanced stages.

"My second question would be: Has our industry on the Pacific Coast realized its obligation to posterity by proficient utilization and conservation practices in the field of raw materials?

"The answer to this question is interwoven with my answer to question No. 1, wherein I cited the broadening of the field of raw materials by use of practically all Pacific Coast woods in pulp making; by the installation of hydraulic barkers in practically every mill on the Pacific Coast, as well as the development of the MgO base and the utilization of the lignin for by-products.

"Now we can add to these developments the intelligent reforestation programs put into effect by the pulp and paper industry on the Pacific Coast, together with the salvage of secondary logging which is being carried on by the pulp and paper companies, as well as closer initial logging practices, all of which has as its effect the removal of every possible pulping fiber from the forests. Let us always be reminded that it is our obligation to do everything humanly possible to see to it that there is sufficient raw materials available for future generations of Americans, and certainly wood is one of the most essential raw materials, not only in peacetime, but is most essential should we ever again become embroiled in future wars. To this end, the Pacific Coast pulp and paper industry is carrying out a most comprehensive reforestation program, as well as a full utilization program, which together with use of new wood species, hydraulic barking, and other savings, has, I would venture to say, conservatively, added 30% to our supply of raw materials for the pulp and paper, and allied industries. Such reforestation programs should be carried out by private enterprise, as private enterprise does things in the most efficient and economical way.

"As a matter of fact, some of the logged off lands now in possession of our counties and states should be made available to pulp and paper companies on the Pacific Coast to round out some of their logged off timber holdings upon which they are carrying out programs of growing trees, whereas, in many instances, under county and state ownerships they are merely lying idle and are not in productive use.

"The third question which comes to my mind is: Has the pulp and paper industry on the Pacific Coast used sound judgment in its expansion programs?

"The answer to this is definitely in the affirmative. Altho the pulp and paper industry on the Pacific Coast has expanded during the past 10 years, it has been a most conservative expansion, and in conformity with population increases in our western states and British Columbia. The major portion of the many, many millions of dollars spent in our industry on the West Coast has not gone into expansion, but has been spent on bringing all of our plants up to their utmost efficiency readying itself for the competition which we all knew was coming sooner or later. In some instances it came sooner than expected, but by and large, the industry on the Pacific Coast is ready for this competition with the most modern plant and equipment available, and with an excellent labor force, who also will benefit from this modernization program. All of this has been made possible partly from good profits, but our industry also has backed its faith in its own business by committing itself for substantial financing by way of loans. Some of our natural markets for our paper and pulp products have not reappeared since the War, due to the dollar shortages, and when such countries as China, Japan, India, Australia, and New Zealand resume normal commercial operations there, no doubt, will be further opportunities for expansion of our great industry in the Pacific Coast."

Education and This Industry

The serious problems of public education policies which this nation is facing up, and the educational problems which this industry must meet, were discussed by another man of management, John G. Strange, who is president of John Strange Paper Co. and presides at their meetings, but is not active in the company now owned by a group of consumers. Mr. Strange is known throughout the industry now for his fine work as secretary-treasurer of the Institute of Paper Chemistry at Lawrence College, Appleton, Wis. He is also secretary-treasurer of Lake States Yeast Corp., Rhinelander, Wis.

He contended that this industry's approach to and solution for some of the fundamental issues of advanced education were "infinitely better and more promising than any approach which is based primarily upon federal aid or federal subsidy."

In explaining that the greatest single problem continuously faced by the Institute is the selection of its student personnel, he said:

"When a paper mill makes some poor paper it can simply route it back to the broke pile, whereas when the Institute turns out a graduate who subsequently flounders, his record will haunt us as long as he lives."

He told how Institute officers each year visit about 80 colleges and universities to interview professors and aspiring students in selecting the next class—limited to 18—for the Institute. And yet, he said, "our yardsticks are not adequate to predict the creative talent of the candidate nor to anticipate his emotional and intellectual capacity to weather the situations he will encounter at the Institute and later in industry." But the "key to our mortality problems as well as to later success" of graduates, he said, "lies in the effectiveness of our original selections."

He described the Institute as a gradu-

ate school with a carefully selected student body, with "little that is vocational" in its curriculum," but "fundamentally and profoundly concerned with various fields of science," and with a program that "recognizes a new profession—the industrial scientist."

Mr. Strange suggested a four-point program for this industry in the educational world:

1. Acquaint faculty members and students with this industry and its needs. "It is not enough to merely go on scouting expeditions among graduating classes. There is room for a real job of public relations."

2. Continuously caution against the danger of too much specialization at the undergraduate level.

3. Assist scholarship and graduate research programs of appropriate colleges and universities.

4. Establish closer relationship with work in graduate schools. Here lies an opportunity for research on some basic problems of the industry, in the way the Institute is pioneering.

Mr. Strange pointed out the net worth of all higher institutions is \$5,000,000,000, over twice that of the entire paper industry. He reviewed the report of a President's commission on higher education which contemplates 4,600,000 enrolled in higher education in 1960—3,000,000 more than the top pre-war enrollment—at a cost of \$2½ billion or five times the highest prewar expenditure. Of this the commission says government should spend \$1,000,000,000 a year besides the quarter billion dollars annually recommended by the President's research board for basic research in colleges.

Referring to health and other welfare projects of government, he said, "a dilemma arises when we add their costs together, and not only a financial one but a dilemma caused by the suggestion that all these good things are automatically due or imposed on each of us, rather than things that should be earned or sought."

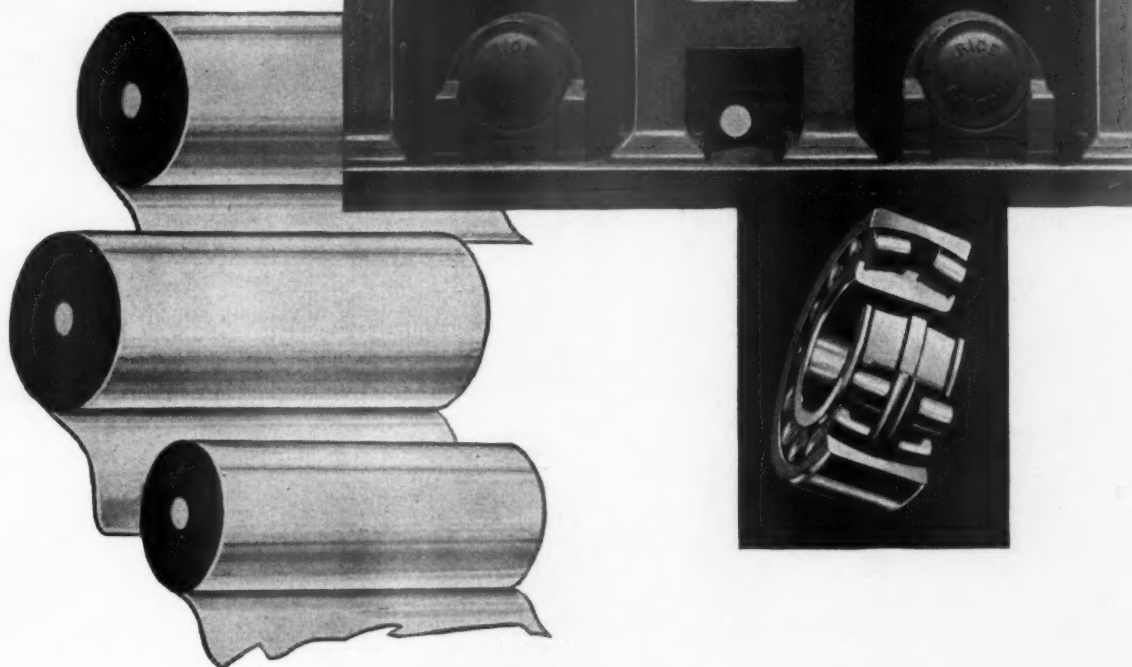
In conclusion he warned that "schools are the guardians of society and in one way they nourish democracy, but in another they may nourish totalitarianism."

First General Session

Dr. Henry K. Benson, professor emeritus, who for 30 years headed chemistry and chemical engineering at the University of Washington, started off the first session of the convention, with a welcoming speech and he recalled early days of the industry in the Far West. It was 40 years since he first came west, he said, visiting Camas and West Linn and when he wrote an article which refuted the opinion of a scientific editor he wrote for — who had predicted that a Coast industry was unsound because it was 3,000 miles from its markets. Dr. Benson told of his personal experiences in the founding of the Coast technical section and of the part this magazine, **PULP & PAPER**, had in helping to make these earliest sectional meetings in the country a success.

President Albert E. Bachmann, who, as

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SKF Bearings are built to take the heavy stresses set up by the dryer cylinder weight and felt tension. And SKF's rocker mount housing design permits unrestrained cylinder expansion and contraction—with maintained location of cylinder center. Because they are self-aligning and require only a minimum of maintenance and lubrication, SKF Bearings have proven their superiority in long years of service.

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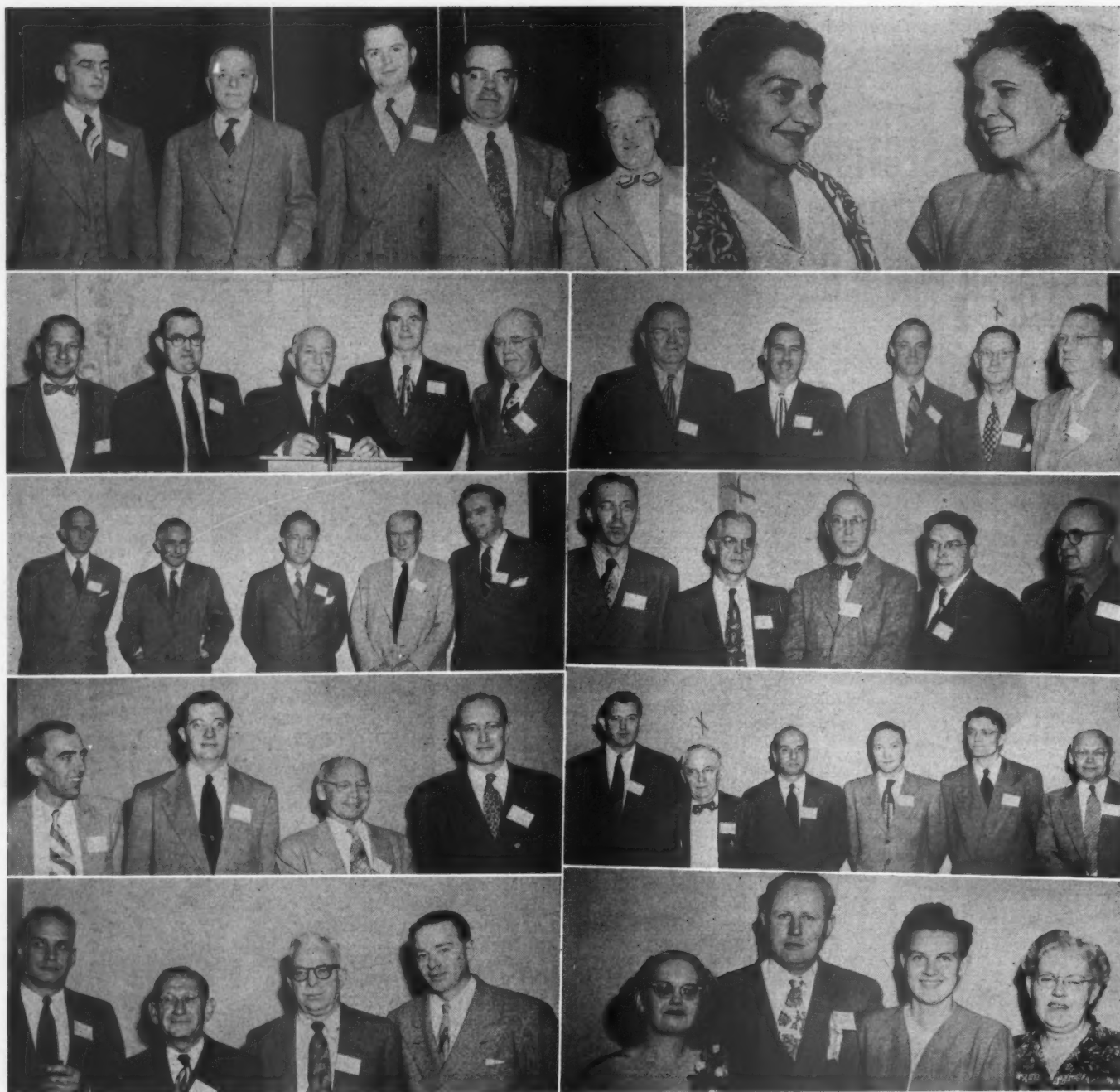


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October, 1949

39



BRAINS AND BEAUTY AT PORTLAND!

Speakers and moderators of technical panels are shown here; also a few of the ladies whose hard work made convention a great success.

Top, l. to r.: Sulfite panel: Vance Reynolds, Puget Sound Pulp, Shibley prize winner; G. A. Richter, Eastman Kodak; Ray E. Baker, Weyerhaeuser; A. S. Quinn, Stebbins; Geo. McGregor, M & O Paper, Moderator; Wives of the Convention Co-Chairmen who were as busy as their husbands—Mrs. A. G. (Cece) Natwick, Crown Zellerbach; Mrs. R. J. (Mugs) LeRoux, Weyerhaeuser.

2nd row, l. to r.: Engineering panel: M. A. Schiel and R. A. Huseby, A. O. Smith; "Bumps" Hemphill, Johns Manville, Moderator; Lee Hill, Weyerhaeuser; J. H. McCarthy, St. Regis. Papermakers panel: A. E. Bachmann, Missisquoi Corp., Moderator; F. H. Abbott III, Sunset-McKee; J. E. Goodwillie, Beloit Iron Works; P. K. Baird, U. S. Forest Prod. Lab.; Donald T. Jackson, Hammernill.

3rd row, l. to r.: General session: Ken Geohagan, Howard Paper Mills, Chair-

man; E. W. Tinker, APPA; E. A. Tippetts, DuPont; Emil Hauser, Inst. of Paper Chem. (retired); John G. Strange, Inst. of Paper Chem. Kraft pulping panel: Harold C. Wall, Longview Fibre, Chairman; J. S. Martin, U. S. For. Prod. Lab.; P. S. Billington and R. M. Hammond, Weyerhaeuser; A. Suter, Gaylord Container.

4th row, l. to r.: Pulpwood symposium: Kenneth G. Booth, Crown Z.; J. M. McEwen, Weyerhaeuser; H. F. Lewis, Inst. of Paper Chem., Moderator; Walter F. Holzer, Crown Z. Fundamental research: J. L. McCarthy, Univ. of Wash., Moderator; G. J. Ritter, U. S. For. Prod. Lab.; O. Goldschmid, Rayonier Inc.; Homer B. Lackey, Crown Z.; J. C. Brown, Jr., and H. F. Lewis, Inst. of Paper Chem.

5th row, l. to r.: Kraft bleaching round table: Mace Harris, Northwest Paper Co.; Ray Hatch, Consultant, ex-Weyerhaeuser; Al Cadegan, St. Regis, and Jack V. Savage, Crown Z., Moderator. Reception and registration aides: Miss Rachel Ellis, Electric Steel Foundry; Walter Salmonson, Draper Bros.; Miss Eva Erickson, Hercules Powder; Mrs. Dorothy Farr, Pac. Coast Supply Co.

has been noted is a vice president and mill manager in Vermont, developed a theme which is now very important to good management in his opening address — cost engineering. He announced plans for a cost engineering committee in the association and set up for its guide posts

— the development of new cost control techniques and standards and of "a literature on this subject in our own language dealing with our own problems."

He pointed out that much work along this line in a general way has been done by the American Management Associa-

tion and the Association of Cost Accountants, but "it is difficult to apply any of it to our very complex paper industry."

R. G. Macdonald, veteran secretary of the association, came next with an appeal for development of leaders in the

(Continued on page 83)

P. 40

North Carolina: kraft container and specialties



A long stride forward was taken by Kieckhefer Container Company's subsidiary, North Carolina Pulp Co., Plymouth, N. C., when in 1947 its huge expansion program climaxed in the start-up of "The Kraftsman"—216" Beloit giant shown above. High speed and top quality production result from the combination of latest design improvements and paper-making skill. This year, a second phase of expansion was rounded out when the No. 2 machine was completely modernized by Beloit...builders of papermaking machinery since 1858.—*Beloit Iron Works, Beloit, Wisconsin.*



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A REVIEW AND APPRAISAL Sulfite Pulp Session

By Dr. Kenneth G. Booth

B.A., Univ. of British Columbia; Ph. D. (Cellulose Chemistry), McGill University.
Chief of Experimental Pulping, Central Research Dept., Crown Zellerbach Corp.

The Sulfite Pulping Session of the Portland convention was certainly diversified enough in subject matter to suit the tastes and inclinations of anyone interested in this field. The papers ranged from fundamental research through applied research to the reporting of commercial production data.

Naturally the paper which aroused the greatest interest, judged from the way delegates were drawn to it, was the progress reported on the Weyerhaeuser magnesium sulfite mill at Longview, Wash. By this, I do not mean to detract from the importance of the other papers which were presented, but this new development is being eagerly followed by the sulfite industry throughout the country. This interest was justified, for Raymond E. Baker, who presented the paper and who is Longview mill manager of the Pulp Div., Weyerhaeuser Timber Co. he gave facts and figures which were up-to-date and very extensive.

Another indication of the growing importance of soluble base sulfite pulping was afforded by the reception given the paper on digester linings. With the advent of good bleaching techniques, kraft pulp has made inroads on those fields in which sulfite previously held sway. The recovery of chemicals and heat in the kraft process has commended it to mill management. Now we can see that through applied research substantially the same benefits can be obtained in the sulfite mills. Of course, the commercial feasibility of soluble base pulping for all situations has not yet been proven. Nevertheless, indications are that the higher cost of the soluble bases, the magnesium, sodium, and ammonium base processes will receive ever increasing attention from mill technologists and production steps.

The First MgO Report

In introducing this paper "A Progress Report on Magnesia Base Pulping," the chairman, G. H. McGregor, supervisor of Pulp, Paper and Byproducts Research, Minnesota and Ontario Paper Co., commented that it represented a definite transition in sulfite pulping, in which all in the industry would be interested. He congratulated those men who through their hard work had brought the process to fruition.

Mr. Baker presented a mass of factual data which heretofore had been known to only a select few. It was presented in the logical manner of starting with acid-

DR. KENNETH G. BOOTH, who wrote this article on the Sulfite Pulping session at Portland and also the one that follows on the Pulpwoods Symposium, was born in Victoria, B. C. He received his B.A. with honors in chemistry at the Univ. of British Columbia in 1940 and then—after a year with Defense Industries Ltd., in Ontario, and four years in the Royal Canadian Air Force—he attended the Pulp & Paper Institute at McGill University, Montreal, studying under Dr. Clifford B. Purves, E. B. Eddy professor of cellulose chemistry, and received his Ph.D. in cellulose chemistry in 1948. He has been in research work at Camas since then, in charge of experimental pulping. He was himself a participant in the Portland Pulpwoods Symposium, contributing one of the papers.



making, and following through the stages of cooking, washing and finally the evaporating and burning of the liquor. The sulfur dioxide concentration in the recovery gases is very low, and 1%, and three towers are required for the absorption of this SO_2 , using a rapid rate of circulation. It was found best to add the magnesium oxide as a slurry to each tower and maintain a definite pH in this system. The additional make-up water is added in the last tower.

Some difficulty was encountered in the form of a buildup of magnesium sulfate because of excess air and high temperatures in the recovery furnaces. This trouble has now been largely overcome,

Air View of new Weyerhaeuser operations from above Columbia River at Longview, which was visited by delegates to the Portland Convention. New MgO plant takes up most of this picture, with Inflico filter plant at lower left. New kraft pulp mill with Rice Barton machine is at upper right and new kraft bleach plant to left of it.



but during the startup of the process, some chemical was lost in this manner.

The digester circulating systems were redesigned for cooking with a low liquor to wood ratio, by placing the collecting rings of the circulation system near the bottom cone. The liquor can be pumped back into the bottom of the digester, and also through three spray nozzles into the top. The digesters are also fitted with a low-pressure relief header and an eductor in order to increase the speed with which the pressure can be relieved to atmospheric. Even with this equipment an extra 20 minutes are required, and because of the static head and the poor circulation at the end of the cook, not all the sulfur dioxide is recovered. Much of this, however, may be recovered from vents in the dump tanks.

The low liquor to wood ratio desired of 2.5: 1 up to 3.5: 1 would mean steam economies both in cooking and evaporation. First tests by cooking under these conditions resulted in greater screenings, and especially in variations from one cook to the next. More low ratio cooks are contemplated in the near future. A somewhat similar result can be obtained, while still having a ratio of 4 or 5 to 1, by adding a portion of waste liquor to the digester following the filling with chips. This also increases the amount of chips which can be packed in per cook. Dumping of the pulp is facilitated by adding waste liquor to the digester.

During dumping the stock is diluted to 3.5% consistency with waste liquor. From the unwashed stock storage, the stock is passed through four Jonsson Knotters and washed on three Oliver vacuum filters in series. This washing is similar to kraft brown stock wash. A foam tank and foam breaker were installed, but were found unnecessary.

Evaporation of the recovered liquor takes place in a six-body, five-effect system. These have outside heat exchangers and forced circulation, and are of stainless steel or stainless clad construction. Loosely combined sulfur dioxide is held in the liquor by neutralizing it to a pH of 7.5 to 8 with some of the recovered magnesium oxide ash. Some scaling has been found to occur.

The liquor leaves the evaporators at about 50% solids content, and then passes to cascade evaporators placed in the furnace gas stream, where the concentration is increased to 65% before the liquor is burned in the furnaces. These produce steam at 650 lbs. pressure, and are of the two drum Sterling extended furnace

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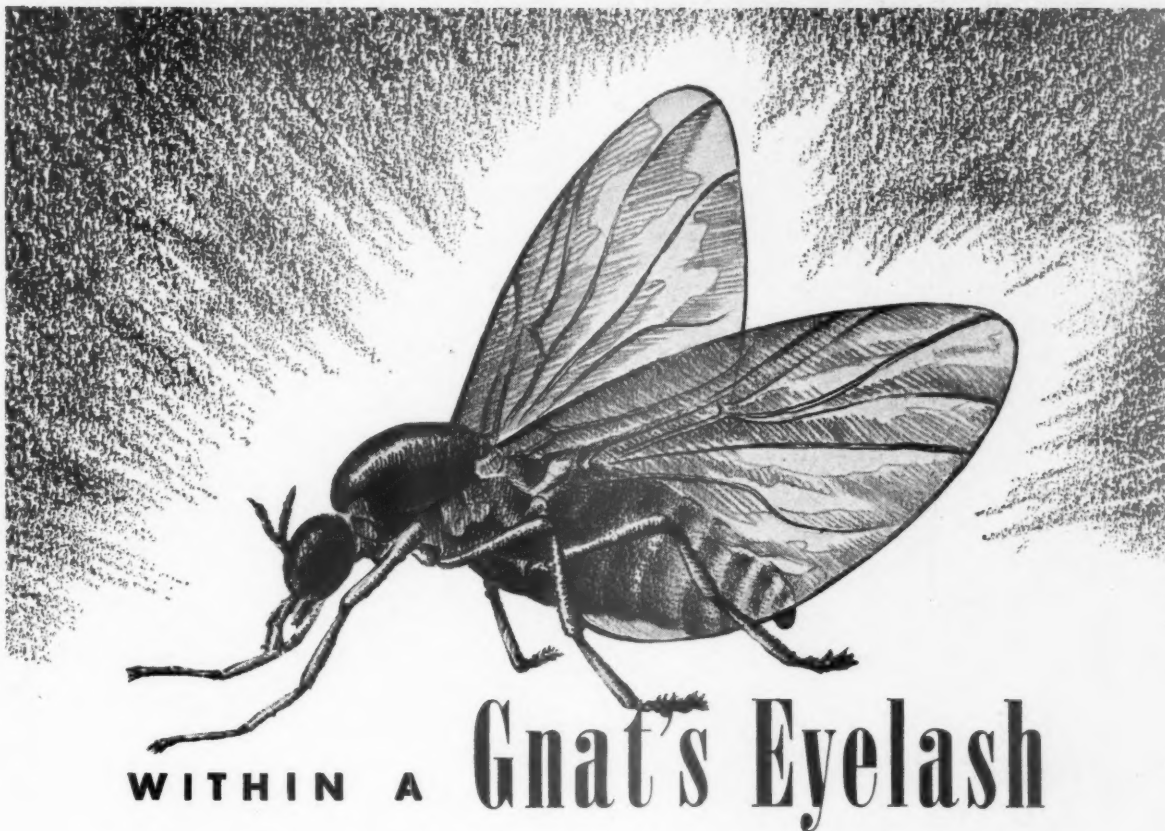
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We haven't the faintest idea as to the diameter of a gnat's eyelash (and care less), but we do know that the new Downingtown Duplex Cutter and Slitter gives accuracy of sheet length to within .0625 which everyone knows is cutting to "within a gnat's eyelash." You're assured of this kind of accuracy and positive squareness of the sheet with the completely re-designed, modern Downingtown Duplex Cutter and Slitter, because of its POSITIVE DRIVE ADJUSTMENT. Unique features, not found in any other machines of this type, assure (1) greatly reduced secondary trimming (2) absolutely minimum wastage (3) continuous high speed operation (all bearings are over-size, anti-friction type), (4) ease of passing sheet and (5) ease and simplicity of slitter adjustment or removal, while running.

This new Downingtown Duplex Cutter and Slitter "must be good," because it hasn't been on the market very long and already eight have been sold, which includes a repeat order from one customer. What more need we say, other than to remind you that, if you want to reduce your cutting and slitting spoilage and maintenance to "within a gnat's eyelash," fill in and mail the coupon today.

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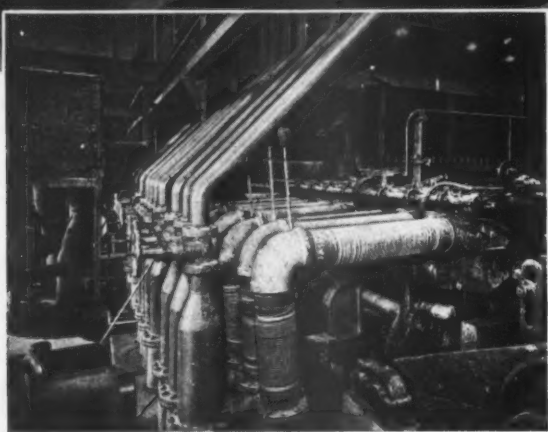
Suction Box Connections

In the new Pusey Jones Machines, each fourdrinier suction box is connected to the air and water header by a simple, single flexible connection. Gone is the cumbersome double hose connection that has always been a source of trouble and an eyesore to the machine operators.

This simplified suction box connection is just one of the many design improvements in the new Pusey Jones Machines, improvements that mean higher speeds, lower production costs and improved competitive position. Let us give you the facts.

THE PUSEY AND JONES CORPORATION

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Above: new fourdrinier suction box connections on the latest Pusey Jones Machines are simple, flexible.

Below: conventional cumbersome suction box connections were often a source of trouble.

type. The magnesia ash is removed by multiclones which precede the cascade evaporators.

It has been possible to overcome the early operating difficulties which were encountered, and during the past two or three months, to recover substantially all the waste liquor available. Material balance figures obtained for a typical one week's operation were given by Mr. Baker. A total makeup of 42 lbs. of 100% MgO and 100 lbs of sulfur per A. D. ton of pulp was required. About 2200 lbs. of solids per ton were burned with a net in steam production of about 4400 BTU per pound of liquor solids. Additional heat was recovered in the gas cooling towers.

Losses of chemicals which were determined were as follows:

Losses—Lbs. per A. D. Ton of Pulp			
		MgO	Sulfur
Dump Tank Vents		10	
In Pulp After Washers	13	22	
Knotter Rejects	1	2	
Evaporator Condensates	9	24	
In Furnace and from			
Acid Plant Filters	11	11	
Total	34	69	
Unaccounted for	8	31	

It was emphasized that the results given were necessarily of a preliminary nature and that even now steps were taken to minimize these losses. Although it is not yet possible to predict the final recovery that will be realized, it may definitely be expected that this recovery will be increased.

In the discussion which followed the talk, John Hart of the Pulp and Paper Research Institute of Canada asked whether the decrease in liquor ratio gave more rejects. Mr. Baker's answer was that this was possible, but that there were other operating factors which influenced this result.

There was also discussion whether the process increased the yield or quality, but the answer was that such an increase, if any, was small, though certainly there was no decrease. It was also brought out that a hot acid system was used.

The Shibley Prize Paper

Taking up the rest of the session, the first was "Separation of Dirt From Unbleached Pulp by Centrifugal Type Classifiers," presented by Vance L. Reynolds, a chemical engineer at Puget Sound Pulp & Timber Company, Bellingham, Wash. This paper won this year's Shibley Award, an annual feature of the meetings of the Pacific Coast technical section. The writer had the pleasure to be present at Longview last spring when the Shibley papers, four in all, were presented. Mr. Reynolds met stiff competition from the other contestants, and he is to be congratulated on being the winner.

A word or two might not be amiss here on the purpose of this award. William R. Barber, in presenting the winner to the first General Session of the Fall Meeting of the Technical Association of the Pulp and Paper Industry, told how Kenneth "Cap" Shibley of Seattle instituted the

award as an expression of his "boundless faith in young men (and) enthusiasm for them to succeed by doing upon their own initiative that small margin of extra thinking and work which marks the difference between the outstanding man and the mediocre man." Following Mr. Shibley's death in 1937, the competition was continued as an annual feature of Pacific Coast Section meetings in memory of the man who started it.

Mr. Reynolds's presentation of the use of the Nichols-Freeman Vortrap and the Bird Dirtec as possible pieces of equipment for the removal of dirt from unbleached stock showed that great care had been taken in planning the research to the end that it would prove a valuable addition to the industry's fund of knowledge.

These centrifugal type classifiers are well known in paper mills for the removal of dirt from stock, but their use in removing dirt from unbleached pulp has hardly received any attention in the pulp industry. Before the main work could be begun, it was necessary to make a careful analysis of the efficiency and accuracy of dirt count in laboratory hand-sheets, taking into account all likely variations arising from different operators or caused by fatigue. Counting of a minimum of twelve handsheets for each pulp sample was found to give results correct to within 10%. In this connection, one is tempted to conjecture how much less laborious such work would have been had the recently developed Papric electronic dirt counter been available for this research.

The Dirtec and Vortrap depend on the same principle as the riffles commonly used to remove dirt in pulp mills, i. e. the settling out of dirt because of higher specific gravity, but with these instruments the force of gravity is increased to 285 times the normal. However, the objectional dirt in unbleached pulp consists mainly of wood particles having essentially the same specific gravity as the fibers. For this reason, little dirt is removed in the collection sump, and about 13% of the stock must be bled from the bottom of the classifier for removal of 30% of the dirt and 10% of the shives. This bleed stock can then be further processed through another classifier and the accepted stock will still have less dirt than the original feed. The accepted stock can then be returned to the head-box of the primary classifier for retreatment. A three stage system with primary, secondary, and tertiary classifiers would give efficient removal of dirt, with little of acceptable fiber. This type of treatment would be applied to stock from primary flat screens, considered to be the best place in a pulp mill for such an installation. However, so far as dirt removal is concerned, other work showed that the classifiers could replace flat screens, if they were preceded by an 18-cut flat-screen knotter.

Translation of the results of research into full-scale mill production is always a knotty problem. There are of necessity many factors which are not easily evaluated on a small scale, and of course a

complete installation of classifiers such as Mr. Reynolds outlined for a 100-ton mill would not be a cheap answer to the problem of dirt removal. A rough estimation of the cost would be fifty thousand dollars, and replacement of existing riffles would probably not be worth while, but for new installations the cost of equipment and the power usage would have to be weighed against the economy of space which would be afforded by the use of such classifiers. It was brought out in the short discussion which followed the paper that no estimation of power usage was available.

Design of Digester Linings

The second paper of the session dealt with the problem of designing digester linings for use in soluble base sulfite pulping processes. Edward F. Tucker, vice president of Stebbins Engineering and Mfg. Co., Watertown, N. Y., was unable to attend and his paper was read by A. S. Quinn, president of Stebbins Engineering Corp., Seattle. The Stebbins organization has been the leader in this work in North America, and recently prepared the linings for the magnesium base mill at Longview.

The report began with an outline of earlier practice in the lining of digesters. Originally the bricks were used to protect lead linings, but later they were applied directly to the digester shell. Because of the nature of the service which these bricks had to perform, a porous structure was inevitable. With the calcium base liquors used this was not of great consequence, for after a short period of use the pores became filled with insoluble calcium salts. Moreover, with the low acid strengths, chemical spalling was of little consequence. With the advent of higher acid strengths, and of ammonium and magnesium base process this situation was to change. The use of these new bases began in the 1920's, but no early mention of special lining requirements was found. There was a little information available from those mills which used the milk-of-lime system for acid-making from dolomite.

The first specific demand for a special lining came in 1940 for the magnesium process, and the advent of ammonium base was on a commercial scale in 1945 added to the clamor for a solution. Over the last 15 to 20 years there have been two main types of linings: Single-course and double-course. These used a Portland cement grout between the shell and bricks, and litharge-glycerin cement for bonding the bricks together. Soluble base process did not provide the protection given in the calcium base mills by the deposition of insoluble salts in the brick pores. The use of denser bricks, which would appear at first to be the logical answer, lead to other difficulties. For one thing, the bond between the bricks and shell is proportional to the porosity or absorptivity of the bricks. Such linings also had a greater tendency to crack under thermal shock. Tests were therefore carried out over a period of

(Continued on page 91)

A REVIEW AND APPRAISAL Kraft Pulp Session

By James H. Hull

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In charge, Process Development, Central Research Dept., Crown Zellerbach Corp.

The alkaline pulping session consisted of three papers and a round table discussion on bleaching of kraft pulp. The three papers presented all showed that considerable thought and work had gone into their preparation aside from work done in obtaining data on which they were based. In this respect they were in the nature of research reports and add considerably to published knowledge on their subjects.

J. S. Martin, chemical engineer, U. S. Forest Products Laboratory, Madison, Wis., in his paper on, "Sulfate Pulping of Logging and Sawmill of Old-Growth Douglas Fir and of Certain Associated Species," has made a real contribution to the intensified forest conservation and use campaign that is being carried on all over the country.

The knowledge of what to expect when pulping this type of material should be valuable to those companies trying to utilize this previously wasted portion of our forests.

His own excellent condensation of the paper follows since it gives the main facts brought out in the paper and the conclusions better than any discussion of its contents can:

"Samples of Douglas fir of a lower quality than desired for lumber were obtained from the vicinity of Oakridge, Ore., and made into sulfate pulp at the Forest Products Laboratory. The samples included rough sound wood from suppressed trees, both old- and young-growth, and portions of old-growth wood infected with white pocket. Wood of equal density and chemical composition but with three stages of decay were pulped: (a) stained wood with incipient decay; (b) firm or intermediate rot; and (c) advanced rot.

"Sulfate pulping tests were also made individually on sound mountain hemlock, noble fir, and lodgepole pine, which are associated with the Douglas fir, and on a naturally occurring mixture of these species with Douglas fir.

"Douglas fir and associated species were all pulped satisfactorily by the sulfate process with chemical requirements comparable with those of present mill practice. The pulps made from wood containing incipient, firm, and advanced rot were equal in yield and had a lower bleach requirement than pulps made from the sound wood.

"The results obtained indicate that the following strength properties might be expected in strong sulfate pulps made from the various woods: (a) Pulp made

JAMES H. HULL, who has written the article on the Engineering session at Portland in this issue and this one on the Alkaline Pulping session, was born in Tacoma, Wash., where Union Bag and now St. Regis operate kraft mills but he never worked in them. However, he has been close to the new modern kraft developments in Crown 2 mills and also to engineering advancement, especially fitting him to write on these two subjects. He obtained his bachelor of science degree in chemical engineering at the U. of Washington in 1933 and has been either in the mill or in research work at Camas ever since. He went into research in 1939 and now is in charge of Process Development in Crown's Central Research.



from sound old-growth Douglas fir wood might be slightly lower in bursting strength and significantly higher in tearing strength than southern pine sulfate pulp and probably could be expected to be used for purposes now served by southern pine pulp except where maximum bursting strength or a fine-fibered pulp are needed. (b) Sulfate pulps made from Douglas fir wood containing decay will be lower in bursting strength than those from sound wood in proportion to the amount and type of decay. The bursting strength of the pulp made from wood containing advanced rot would probably be about 75 per cent of that of southern pine pulp. (c) Mountain hemlock, noble fir, and lodgepole pine will give pulps with excellent bursting strength and fair tearing strength. (d) Sulfate pulp made from a mixture of 70 per cent Douglas fir, 10 per cent mountain hemlock, 10 per cent noble fir, and 10 per cent lodgepole pine would have a good bursting strength and excellent tearing strength and be of higher quality than pulp made entirely from sound Douglas fir. (e) Pulp of the quality of that obtained from sound Douglas fir would be produced from compositions of wood in which either 2.6 parts of wood with incipient decay, 1.7 parts of wood with firm rot, or 1.2 parts of wood with advanced rot are mixed with 1 part of any of the associated species, mountain hemlock, noble fir, and lodgepole pine.

"Because of the packing characteristics of the chips, the lower moisture content of the several types of decayed Douglas fir as compared to that of the sound wood would tend to cause a lower pulp produc-

tion rate and require an adjustment of the chemical charge in the digester."

Mr. Martin was asked if the effect of the decay on the black liquor was evaluated. The reply was that no specific information was obtained other than that the density and extractives were normal. The question of ratio of springwood to summerwood was also raised and the reply was that it was impossible to measure it due to rot. It was also brought out that all the decay was in the heartwood and was all the same.

Clarification of White Liquor

A. E. Reed and Wilbur F. Gillespie of Gaylord Container Corp., in their paper on "Centrifugal Clarification of Kraft White Liquor," show that the industry is, at least in part, trying to find new and better ways of doing some of the operations that have been carried on with the same bulky pieces of equipment for so many years.

The Gaylord Container men deserve to be commended for a form of literary courage in going ahead with this report even though the work done was not entirely satisfactory.

While the results reported were mainly negative we can hope that more companies will be stimulated to hunt for both space and labor saving equipment along similar lines. The authors own condensation is quoted below since it covers the highlights of the work completely:

"An experimental Bird continuous centrifugal filter was used to study the separation of lime sludge from white liquor. The unit was 18 in. in diameter and 28 in. long. A white liquor rate of 10 g.p.m. and a product of satisfactory clarity were necessary for acceptable operation. The filter was set up to be fed unclarified green liquor and causticized liquor.

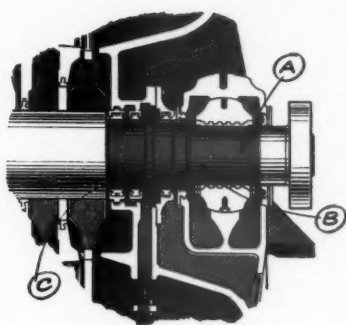
"Preliminary tests were made on causticized liquor followed by a continuous running period on mill slurries during which time a rate of 10 g.p.m. centrifuged liquor was maintained for 263 hours. Final tests were made on slurries held at constant composition to study the effect of feed rate and feed temperature variation.

"At a rate of 10 g.p.m., if the other variables are held constant, the clarity of centrifuged liquor is about equivalent to tray clarified liquor; however, the latter can be more easily clarified by secondary clarification.

"At a liquor rate of 10 g.p.m., variation

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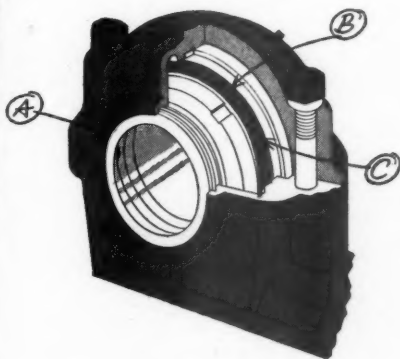


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in per cent solids in the feed up to 11% has very little effect on the clarity of the white liquor. Above 11% a slight variation in per cent solids in feed has a large effect on the white liquor clarity.

"With other variables constant, the per cent solids in the centrifuged liquor increases with decreasing temperature. A temperature change from 195° F. to 165° F. doubled the per cent solids in the white liquor.

"Maintaining a feed temperature of 186° F., a rate of 10 g.p.m., and per cent solids in the feed at approximately 9% the other variables affected the white liquor clarity as follows:

"1. Increasing available CaO above 3% increases the per cent solids in the centrifuged liquor.

"2. Activity of the white liquor has no appreciable effect on its clarity.

"3. Green liquor solids in the causticized liquor are not effectively removed in the centrifuge.

"Attempts to clarify green liquor in the centrifuge were not successful. With 0.0344% solids in the feed and at a rate of 6.21 g.p.m., 83.3% of the solids remained in the liquor."

The Gaylord Container paper was presented by General Supt. A. Suter of the Gaylord mill, because of the inability of either of the authors to be present. In the discussion it was brought out that no evaluation of the pulping quality of the centrifuge clarified liquor was made. It was also suggested that other materials such as iron compounds rather than the amount of CaO in the liquor might have a detrimental effect on the settling of the liquor.

Douglas Fir Pulps Compared

The paper by R. N. Hammond and P. S. Billington, Research Dept., Pulp Div. Weyerhaeuser Timber Co., Longview, on "Relation of Kraft Pulp Qualities to the Wood Properties of Douglas Fir" was ably presented by Mr. Billington with Mr. Hammond aiding in discussion afterwards.

This paper supplemented Mr. Martin's paper giving a different angle on sulfate pulping of Douglas fir. It was "a report of an investigation of the yield, chemical and physical properties of sulfate pulps as related to the physical properties of Douglas fir represented by seven types of wood," from which the pulps were made. Each lot of wood representing each type was sorted so as to contain only sound wood.

The authors summarized their results very well, as follows:

"Douglas fir logs in the following growth classes were selected and evaluated: 350 year old slow growth; old rapid growth heartwood (plywood veneer cores); 95 years old rapid growth; 85 year old slow growth; 50 year old medium growth; 40 year old slow growth; 30 year old rapid growth. The samples were evaluated as to average rate of growth, percentages of bark, sapwood, springwood, wood density, and chip density. The woods were all cooked identically to give pulps of from 14 to 17 Tappi Permanganate Numbers. The yields varied roughly

with the percentage of sapwood. Mullen, fold, and sheet density varied directly with the percentage of springwood, and the tearing strength inversely so. The percent alpha-cellulose was definitely lower in pulps from the woods younger than 85 years old. The young woods produced pulps which bleached to a higher brightness under the same bleaching conditions, but also suffered slightly more strength degradation in bleaching."

The work was also well summarized on their chart used throughout in presenting their data. On the whole the paper was well organized and ably presented. The practice of using a chart similar to the one used in this presentation is a distinct aid in presenting results and data and enables listeners to visualize and follow them.

In the discussion, a question was asked if it was felt that the results justified a recommendation for wood segregation, along the lines of their selection. The reply indicated it would be a good idea but practical considerations probably would not permit it since a large portion of their pulpwood was sawmill waste. Another point was that the primary effect was caused by the ratio of springwood to summer wood.

Another question had to do with the results that could be expected if the woods were cooked as a mixture rather than separately as these were. The reply indicated that results from mixture cooking could be calculated from the results presented.

Kraft Bleaching Forum

The round table discussion of kraft bleaching was led by Supt. J. V. Savage, Crown Zellerbach, Camas, Wash., who acted as moderator. The panel consisted of R. S. Hatch, consultant formerly of Weyerhaeuser Timber Co., A. M. Cadegan, chief chemist of St. Regis, Tacoma, and Mace Harris, manager of pulp manufacturing, The Northwest Paper Co, Cloquet, Minn.

Mr. Hatch outlined the background of kraft bleaching and the steps leading up to the present day practices. He stated first attempts to bleach kraft were made using the same procedure as was then used when sulfite was bleached. That is hypochlorite was used in a one or two-stage process. This gave a pulp of about the same strength as bleached sulfite. And thus failed to take advantage of kraft strength.

However, in 1854, essentially the same process as used now was tried by W. Burgess. That is, the pulp was chlorinated, washed, extracted and then bleached with calcium hypochlorite. This was merely experimental because at that time materials of construction were not available that would withstand low pH and liquid chlorine was not available. In 1913 a Frenchman, Devin, patented a process very similar to the ones being used at present on kraft. With the advent of liquid chlorine bleaching began to be carried on. Since then the development of kraft bleaching has resulted in more and more stages being added to the pro-

cess until now some of them go as high as eight. In Europe the same principles are used as in this country.

It was predicted that sodium chlorite or chlorine dioxide would find an increasing use in pulps of high strength and color. Present cost is too high to warrant its use but it is expected to eventually come down to where some may be used to produce high color and high bleached krafts.

Submitted questions were then discussed by the panel with the audience participating. The first had to do with the troubles experienced in the measuring of the chemicals used in the various stages of bleaching. In general there was no trouble experienced in measuring the hypochlorite solution or caustic solution. However, the measurement of lime solution gave trouble in that rotameters used scaled up. In one mill a pH recorder controller was used. This gave good operation as long as production was light. However, when production and consequent flow was low, lime precipitated and scaled the line. It was reported that in Sweden some people used V-notch weirs and one mill was using an orifice similar to the one in the Canadian standard freeness tester in conjunction with a weighted arm.

The next question had to do with control of the addition of hypochlorite and lime in the second stage. One answer was that they were breaking down a 1¼" line to 3 small lines and hoped to keep one of them open. It was suggested that circulation be practiced in order to keep the high flow through the lines.

The next question was, Why do some customers run brightness on samples of pulp from the bale instead of making a handsheet using distilled water as specified in Tappi standard? There was no answer given except that checking color of pulp shipments should be done by Tappi standard methods. Color reversion and measurement were defined and measured as the differences in color between the outside of a stored sample and a handsheet made according to Tappi standards.

The next question had to do with the difficulty experienced of sizing bleaching kraft. It developed that all of the mills represented experienced that difficulty. No remedy was given although a suggestion was made that a wash of sodium sulfite and sodium carbonate be tried as a substitute for caustic soda washing in the hope that it might leave some of the materials in the pulp that were ordinarily extracted by a sodium hydroxide.

The last question discussed had to do with removing of chemicals after the first stage of bleaching. It was generally conceded that all the chemicals should be removed by either a soak or a washing before any additional bleaching was done. Otherwise, the pulp is completely ruined in subsequent stages. As to how much can be left in, there was apparently no definite answer, merely that all of the free chlorine must be washed out.

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A REVIEW AND APPRAISAL Papermaking Session

By Dr. John S. Barton

B.S., U. of Wash.; M.S. and Ph.D. (Organic Chemistry), Institute of Chemistry, Appleton, Wis.
Chief of Paper Products Development Section, Central Research Dept., Crown Zellerbach Corp.

The papermaking session commenced with a review of "Use of Beater and Headbox Additives for Improvement of Sheet Characteristics," by Jack E. Jayme, John C. Tongren and Donald T. Jackson of the Hammermill Paper Co., Erie, Pa.

The search for a hydrating agent that could be literally "poured from a barrel" has been going on for a number of years. The concept apparently originated with Schwalbe, who, as early as about 1890 obtained a patent for the use of overbeaten stock or "cellulose gel" to increase sheet strength with less physical refining. Since that time many diverse materials have been tried in an effort to minimize engine refining and obtain stronger sheets with less curling tendency and less two-sidedness.

As examples are such common and exotic substances as locust bean gum, guar, deacetylated karaya gum, carboxymethyl cellulose, methyl cellulose, starch, sucrose, psyllium seed extract, formaldehyde, various synthetic latices and resins.

After a review of the more acceptable theories of the bonding mechanism of the fibers of a paper sheet, the possible modes of action of the chemical hydrating agents were discussed. By their deflocculating action, the number of fiber crossings may be increased and thus the bonded area increased to the betterment of sheet strength. Some of the materials evidently form active films upon the fiber surfaces which exert an increased bonding action of their own. As an example of the effects obtainable, 1% of locust bean gum in a sulfite stock resulted in the same strength after 20 minutes beating, that an untreated stock required 50 minutes to develop. Guar gum has been found to aid drainage, and thus make possible higher machine speeds producing a sheet of better strength. As a rule, alum is not compatible with these materials so that most of the experimental sheetmaking has been carried out with little or no alum present in the furnish.

High viscosity methocel has been effective in increasing mullen and fold of cotton fibers and the use of sodium CMC reduced beating time with better strength properties. "Tufjel" helped filler retention but no strength improvements were noted during a machine trial. Of the natural and synthetic latices tried, Neoprene appeared the most promising as it increased both wet and dry strengths. A synthetic resin, Amberlite W-1, increased strength with decreased beating time.

Although there is much disagreement

DR. JOHN S. BARTON, who has written this article on Papermaking session at Portland, and the one that follows on the Fundamental Research session, was born in Boise, Idaho. He received a B.S. degree in chemistry at the University of Washington in 1940 and a Master's degree at the Institute of Paper Chemistry in Appleton, Wis., in 1942. His Ph.D. in organic chemistry also was granted at Appleton in the institute which is a part of Lawrence College, in 1947. He was a wartime U. S. Navy electronics officer, specializing in submarine repair work, and most of his service was at sub bases and bases overseas. Before the war, he worked briefly at Waldorf Paper Products Co., St. Paul, and since Jan., 1948, has been in Crown Z's Central Research at Camas, and is now supervising the Paper Products Development Section.



on the proper use of starches, they are the most widely used of the possible chemical hydration agents. Small percentages of soluble starch appears to increase the fiber bond strength.

The results obtained by the materials discussed have varied considerably from mill to mill. This lack of consistent performance has been puzzling and has hampered further development. It may be due to the different ion and salt contents of the various process waters, or some critical feature of the drying process. In any event, widespread adoption of an effective hydrating and deflocculating agent must await further research into the basic principles involved.

Resins and Kraft Paper

Many materials are now being used to modify paper properties and thus give products to fulfill specific use requirements. The treatment of paper with phenolic resins is probably one of the more common of these modifying operations. An investigation of the "Effect of Phenolic Resins on Physical Properties of Kraft Paper" was reported in the second paper by P. K. Baird, R. J. Seidl and D. J. Fahey of the Forest Products Laboratory, Madison, Wis. This work was of a fundamental nature and no practical applications to papermaking practice were suggested.

Kraft papers of several weights were impregnated with various percentages of phenolic resins of both the water-soluble and alcohol-soluble types. The treated sheets were cured at 325° F. for 6 min-

utes with no pressure applied. The cured samples were evaluated and changes in the following properties (as compared to untreated samples) were noted: Caliper, density, porosity, water vapor transmission, tensile strength, stretch, dimensional stability and equilibrium moisture content.

In general, it was found that the caliper was increased beyond what one would expect from the amount of material absorbed. There was no significant change in density, since the increase in thickness was offset by the increased weight. The porosity was increased while the water vapor transmission was decreased about the same amount over the range of 14-30% resin content. The tensile strength (both wet and dry) was increased, the dry tensile being increased more in the cross machine direction than in the machine direction. The stretch and equilibrium moisture content were both decreased. The dimensional stability under various humidities was much improved, requiring about 24% resin for optimum effect.

On comparing the water and alcohol soluble resins, it was noted that the sheets treated with the water soluble phenolic had better wet tensile strengths, lower equilibrium moisture content and better dimensional stability. The equilibrium moisture content of the alcohol-soluble resin sheets was no different from the untreated samples.

"No Supersonic Barrier to Speed" Says John E. Goodwillie

With each year seeing a new paper machine speed record being made, one might well conjecture as to how much longer this can go on before a speed ceiling is reached. In his paper "Machine Production Possibilities," J. E. Goodwillie, vice president of the Beloit Iron Works, stated that "there is apparently no supersonic barrier to be crossed and we feel confident that each year will bring new developments and new production records."

Present day machine speeds when running a particular sheet are limited by some situation or condition (i.e., formation, drying) which becomes unfavorable at higher speeds. In most instances the limiting factors can be modified or removed, thus raising the production level of the machine.

The particular section of a Fourdrinier machine that imposes the greatest limitation to production advances is generally held to be the combination of distributor, head box and slice. Hydraulic engineering

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of high order in recent years has resulted in flow quantities of over 150 gallons per inch of slice being effectively handled on heavy production machines. The development of the enclosed head box and the combination of pressure and static head at the slice has apparently removed the limitations that previously existed in this part of the machine.

The length of Fourdrinier wire does not appear to impose speed limitations. Wire lengths up to 130 feet are being handled with ease.

The final de-watering of the sheet and its separation from the wire at the couch end involve some of the most interesting design problems for high speed operation. One approach has been the use of two separate vacuum couch rolls, the first of which removes most of the water from the wet web. Various types of automatic transfer arrangements not requiring the conventional wet pick-up felt have been placed in actual operation and will soon be used on high speed machines.

Increasing the number of suction presses has been found necessary in high speed operation.

As for the dryer section, operating steam pressures up to 100 pounds gauge are becoming more common by virtue of improvements in machine design and metallurgy. For special drying problems, the drying capacity of existing machines may be augmented by the use of radiant heat and high frequency electric drying, especially where space is at a premium.

Size presses can now be designed to op-

erate at 1000 feet per minute while machine coating is being carried out at 1200 feet per minute. It is now believed that supercalendering need not be a separate operation but can be done on the machine.

"No limitations are evident in the reel and winder section of Fourdrinier machines," he said. As for the drive, the author seems partial to the mechanical drive and listed several convincing advantages.

Consumer Ideas on Quality

The paper quality requirements of the manifold printer were discussed in an entertaining manner by F. H. Abbott III of Sunset-McKee Co., San Francisco, in the concluding paper, "Consumer Ideas of Paper Quality."

Of interest to local listeners was Mr. Abbott's statement that eastern-made papers punch and penetrate more clearly than the western product, probably due to the shorter fiber length of the former.

Leading manifold printers were queried as to their opinion on the importance of such factors as basis weight variations, caliper, opacity, tear, moisture content and surface smoothness. Some of these brought for a variety of comment, there being almost as many ideas on smoothness as firms questioned.

It was easy to understand that there was no industry-wide agreement as to what constitutes a good manifold sheet, and that some fundamental work toward this end with resultant standardization might be in order.

Forum on Quality Control

Due to the lack of more general audience participation the "Open Forum Discussion of Quality Control in the Mill" was carried on largely by A. E. Bachmann mill manager of Missisquoi Corp. and Dr. D. T. Jackson, research director of Hammermill Paper Co. Mr. Bachman emphasized the need of more adequate equipment and better trained personnel. Our testing procedures must be better controlled and more formalized quality control system is necessary. Some doubt was expressed as to the utility of statistical quality control in pulp and paper mills.

Dr. Jackson commented on the experiences of the Hammermill Paper Co. in their quest for a suitable quality control system. They found statistical control difficult to apply because of the inherent variations in mill process. However, statistically determined product sampling from finished products has shown promise. They have decentralized control stations and placed them as close as possible to the operation point. Again, the need was stressed for more adequate tests since many of our present tests do not evaluate desired qualities.

In the opinion of Dr. Jackson the tester should be the final judge of product quality, while Mr. Bachman held that the machine operator should exercise that prerogative, and concluded his comments with a description of the sampling methods of his company.

A REVIEW AND APPRAISAL Engineering Session

By James H. Hull

B.S., Chem. Engineering, University of Washington.

In charge, Process Development, Central Research Dept., Crown Zellerbach Corp.

The papers presented at the engineering conference concerned subjects of interest to everyone connected with design and construction of pulp and paper mills. These papers, if studied thoroughly, should furnish helpful information to any one, no matter how well informed on the subjects. They are all well written and give evidence of considerable thought and work being put into their preparation.

There is only one minor criticism I have to make—in one or two cases the way the paper was organized does not conform to good technical paper organization.

R. A. Huseby and M. A. Scheil of A. O. Smith Corp. on "Corrosion and Corrosion Testing in the Pulp and Paper Industry" present a difficult subject in a manner that, while mainly technical, contains a great deal of material that the non-technical operator can readily understand and put to use.

They define corrosion as "destruction by chemical or electrochemical agencies

in contrast to erosion which denotes destruction by mechanical means."

Corrosion is divided arbitrarily into the following briefly summarized different types, for purposes of diagnosing failures. All corrosion reactions, they state, involve an anodic and cathodic portion which occur simultaneously with an electron flow between the two areas. This is a condensation of their paper:

1. General or Uniform Attack

Changes in temperature pH value, removal of inhibitors, and removal of oxidizing agents may result in an accelerated general attack.

2. Pitting

This is one of the most destructive types and occurs in stainless steels as a result of local breakdown of passivity which results in current flow starting corrosion. The chloride ion is especially active. Proper heat treating and alloying prevent this.

3. Intergranular Attack

This occurs in stainless 18-8 when it is not properly annealed, or if in stress relieving it is heated to 1100 Deg. F.,-1200 Deg. F. Several methods are available for preventing this, all of which are under control of the steel mill and fabricator.

4. Stress Corrosion

Evidenced when metal failure occurs suddenly with stresses below the yield point. These stresses are present as residual stresses from fabrication or as applied stresses. This can generally be prevented by proper annealing.

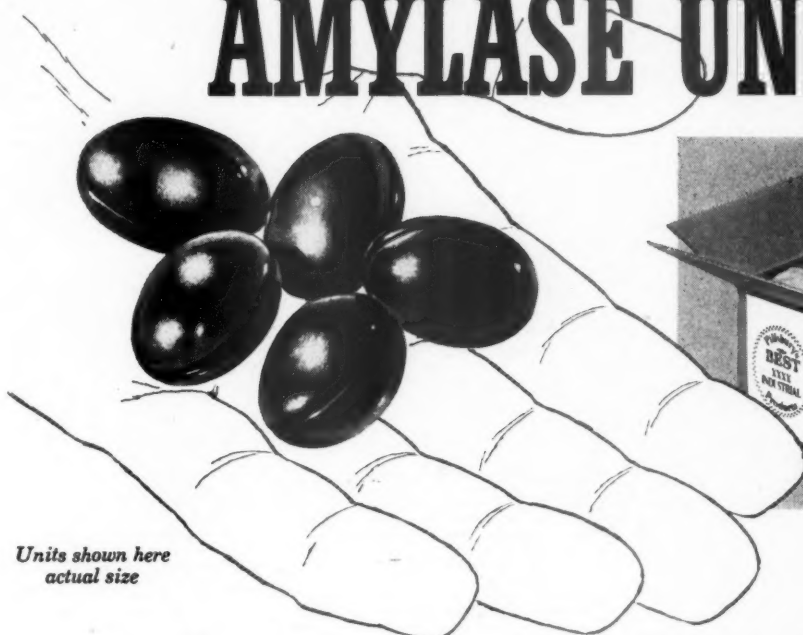
5. Galvanic Corrosion

When two dissimilar metals are in contact or electrically connected in an electrolyte the potential set-up between them can cause severe corrosion of the anodic-least noble-metal. This can be prevented by exercising care in coupling of dissimi-

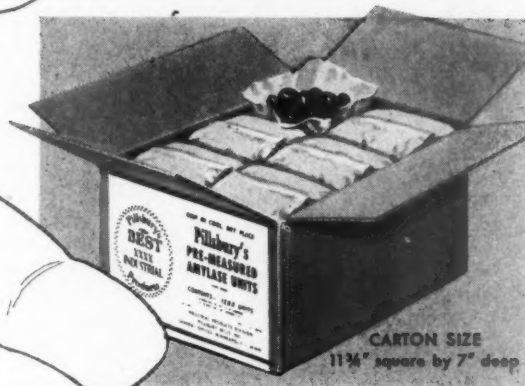
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October, 1949

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lar metals and in applying metal coatings. Also, the use of cathodic protection helps. This is done in two ways:

(a) Electrically connecting a sacrificial anode of less noble metal to the metal to be protected, and (b) Impressing a potential and supplying a current cocenter to that set up by the corrosive reaction.

6. Dezenification

This involves leaching out of the principal alloying elements and deposition of copper. Small amounts of arsenic, antimony and phosphorous are added to brasses to prevent this.

7. Erosion Corrosion

This involves gases or liquids under high velocity. Cavitation and impingement are two examples. When active critical velocities are exceeded films are removed and corrosion goes on continuously. Field corrosion tests are discussed and described thoroughly, and examples of these different types of corrosion occurring in the pulp and paper industry given. Numerous photographs and tables illustrating the various types are presented which if studied carefully should be helpful to anyone specifying materials of construction in any of the pulping processes. In the discussion on corrosion, a kraft mill operator asked if there was some copper alloy that could be used for some of the applications. The answer by Mr. Scheil was that the stainless steel resisted corrosion better than any copper alloy.

A question was asked about an alloy for handling moist chlorine. The answer of this was that the best one to date is "Hastalloy C". Mr. Scheil stated that they have a new alloy which is not in commercial production yet which contains 27% chromium and some molybdenum. However, it is hard to roll but can be welded.

It was asked: What is the best material to use for melting coils in sulfur tanks. Mr. Scheil stated that he could give no help on that but that probably a low nickel alloy would be the answer.

Hydraulic Barking Review

S. E. Hill, plant engineer of Weyerhaeuser Timber Co.'s pulp mill at Everett, Wash., presented a paper entitled, "Hydraulic Barking, a Summary."

This paper is timely because of the tremendous interest in hydraulic barking and the numerous installations recently made or being made. He discusses the large savings possible by the use of hydraulic barkers, and whole log chippers, amounting, according to figures quoted, to about 20% of the log as received at the mill. From a forest conservation and sustained yield standpoint some of the barkers discussed should prove valuable because they bark and clean logs that are ordinarily uneconomical to handle due to size, shape, or excessive rot.

The table published herewith presented in his paper summarizes the characteristics of design of the various types of hydraulic barkers covered. Each type listed in the table is discussed and its advantages and disadvantages listed fairly comprehensively. Two features of design he

THESE ARE TYPES OF HYDRAULIC BARKERS DIFFERENTIATED BY LOG MOVEMENT AND BY NOZZLE MOVEMENT

(From original chart by Mr. S. E. Hill but amplified by Pulp & Paper)

		LOG MOVEMENT									
		Axial Slow	Axial Fast	Axial Slow twist	Axial Fast twist	Axial Fast index	Transverse	Transverse Indexing	Transverse Slow rotating	Transverse Fast rotating	Transverse Fast rotating Centers
NOZZLE MOVEMENT	Stationary	Soundview Pulp Co. Everett St. Regis at Tacoma	Slab bark	Worthington	A. C. Stream barker	Weyerhaeuser Timber Co. experimental					
	Oscillating	C-2 at Port Angeles	A. C. Slab barker at Shelton	Weyerhaeuser Timber Co. Longview saw-log barker							
	Reciprocating						Weyerhaeuser Timber Co. at Everett	Weyerhaeuser at Longview	C-2 at Port Townsend Rayonier at Port Angeles & at Hoquiam Publishers' Paper Co. at Oregon City		Pugot Sound Pulp & Timber Co. at Bellingham
	Rotating	Elcedal Stewart & Welch Alberni, B. C. (coaxial) Nanaimo Sulphate Pulp Ltd. Nanaimo, B. C. (perpendicular to axis)	Rayonier at Hoquiam new A. C. Slab bark.								

states are common to all of the successful barkers; the use of very high pressure water and having the axis of the water jet perpendicular to the surface of the wood. The jet does not chisel the bark off the wood, but erodes or explodes it off.

The paper, on the whole, is a very comprehensive summary and the bibliography lists articles containing in most instances very good descriptions of each installation.

The question was asked as to whether any of the barkers discussed would handle anything that could be fed it. Mr. Hill stated that he had seen the Bellingham barker handle a canoe shaped log. The question concerning wear on water nozzles was raised and the answer to that was to use filtered water.

Engineering Design

J. H. McCarthy, chief engineer, St. Regis Paper Co., Tacoma, Wash., presented a paper on, "Paper Mill Design and Construction," which describes the engineering and construction work on the recently completed mill of the St. Regis Paper Co. in Tacoma. He states that here a high-speed kraft paper mill was designed, built, equipped, and put into operation in a period of less than 17 months.

He describes the system used for coordination of engineering, purchasing stores,

accounting, and operating departments. In this system a code of numbering is used which is carried through from engineering to the accountant's plant ledger.

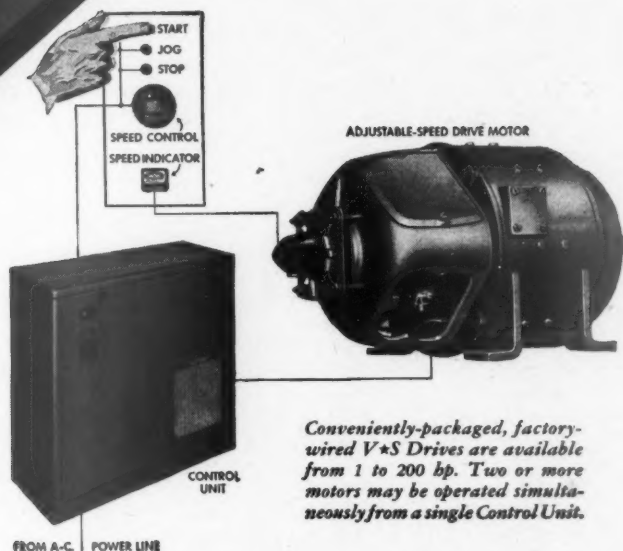
Ordering of equipment as soon as possible, especially the long delivery items, was stressed, as well as cooperation between engineering and the operating superintendent who was appointed while the mill was still on the drawing board.

A unique feature of the design of the building is the 12" W.F. beam across the press and dryer pits. This beam is anchored in the concrete so that the full strength of the beam may be developed either in tension or compression. This ties the building together so that the two halves are not displaced by earthquakes.

Several other unique design features are described as well.

The paper machine, he states, is a 180" machine designed for the production of multi-wall bag paper at a maximum ultimate speed of 2100 ft. per minute. All equipment, including the stock preparation, is strictly modern and nearly all controlled from one main control room.

The most important point of the paper, however, as mentioned earlier, was the outline of the careful planning and coordination among the various phases of construction and startup in the relatively short time of 17 months.



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A REVIEW AND APPRAISAL Pulpwoods Symposium

By Dr. Kenneth G. Booth

B.A., Univ. of British Columbia; Ph. D. (Cellulose Chemistry), McGill University.
Chief of Experimental Pulping, Central Research Dept., Crown Zellerbach Corp.

There are few mills, indeed, that are able to pick and choose just exactly the pulpwoods which they would like to have. Usually, for economic and other reasons, they must use those species which are available in their vicinity.

Most woods have their own advantages and disadvantages, and to utilize the former and make adequate compensation for the latter is a never-ending problem. An exact appraisal of the wood properties is essential for such purposes, and therein lies the value of the three papers on the comparative properties of western hemlock, western red cedar, Douglas fir, eastern black spruce, and loblolly pine which composed the larger part of the Pulpwoods Session at the Portland Fall Meeting of the Technical Association of the Pulp and Paper Industry.

Sources of West Coast Woods

A fitting and very logical introduction to the symposium was provided by Mr. J. M. McEwen of the Research Department, Pulp Division, Weyerhaeuser Timber Co., Longview, Wash. His paper dealt with the sources of pulpwood on the Pacific Coast. For many years, he said, the pulp industry has operated principally on western hemlock logs, with smaller amounts of white fir and Sitka spruce being used. These are still, and will continue to be, important species, but the expansion of the industry calls for fuller utilization of material that was formerly logging or lumber mill waste. Much of this material is Douglas fir, and while it is quite suitable for sulfate pulping, the sulfite mills cannot use it because its heartwood cannot be satisfactorily pulped by the acid process, despite much earnest research effort.

Mr. McEwen stressed that sustained yield production on the west coast is by clear cutting of successive areas. Selective cutting within a given area is not suitable. To provide for natural reforestation, seed blocks are left. Besides that provided by large scale logging, considerable pulpwood is produced by pre-logging and re-logging, operations which can be carried out by small crews using light equipment.

Pre-logging is of two types: The removal of small trees in an area before they are damaged by the main logging operation, and the thinning of second-growth stands to allow better development of the remaining trees.

Re-logging is the removal of logging wastes following a large scale cutting,

and has been found to provide very large quantities of usable pulpwood.

The tendency toward ever better utilization of our forest resources has made its effect felt in other places than the logging camps. Mills on the Pacific Coast are finding it increasingly necessary to provide wood room facilities for barking and chipping many kinds of pulpwood, including whole logs, cord wood, waste slabs, and clear mill waste.

Research at the Institute

The other four papers on the program had a common source, in that they arose from a research project set up by the Crown Zellerbach Corp. at the Institute of Paper Chemistry in 1945, and carried out jointly since that time by the staffs of the Institute and of the Central Research Dept., Crown Zellerbach Corp.

As Dr. Harry F. Lewis of the Institute of Paper Chemistry phrased it in his paper, "The Significant Chemical Components of Western Hemlock, Douglas Fir, Western Red Cedar, Loblolly Pine, and Black Spruce":

"The purpose of the project was to develop basic information with reference to the chemical and morphological characteristics of important pulpwoods and the relationship between these characteristics and the properties of the pulps produced from the woods. Specifically, the project was intended to explain the chief causes for the difference in kraft pulps obtained from Douglas fir and western hemlock."

Douglas fir kraft possesses a high tear resistance, but it suffers somewhat from low bursting strength, when compared to hemlock kraft.

As mentioned earlier, three western woods were chosen for the study, and for purposes of comparison an eastern wood, black spruce, and a southern wood, loblolly pine, were included. Dr. Lewis detailed the methods by which the necessary samples were obtained, and by which the very extensive analyses were carried out on both the woods and the pulps produced therefrom. The data obtained form a very valuable addition to our knowledge of pulpwoods, because they were the results of completely analogous experiments.

One of the tables presented gave a summative analysis of each wood, and this showed that the main difference between the fir and pine, on the one hand, and the other three woods appears to be the lower hemicellulose B and the

greater alpha-cellulose contents of the former. The three western woods are also low in pentosan.

Another difference to which Dr. Lewis drew attention was the lower uronic anhydride content of the fir and pine, and the greater percentage of this appearing in the alpha-cellulose fraction. This was especially noteworthy in the case of Douglas fir. Western red cedar showed a very high extractive content, and this extractive-free wood had a very high percentage of lignin. In this latter respect and in certain other ways, this species resembles redwood.

Methods of Pulping

The third paper of the session, given by the writer, outlined the methods by which the five wood samples were pulped at Crown Zellerbach Corp.'s Central Research Department, at Camas, Wash. This work was standardized to a high degree, in order that the pulps would be strictly comparable. The kraft cooks were prepared in an experimental rotary digester to give pulps with a TAPPI permanganate number as close to 30 as possible. Hemlock proved to be the slowest pulping species, while eastern spruce was the fastest. The other three woods were intermediate and nearly equal in ease of pulping. Tables and figures were presented to show the pulping data and the physical properties of the resulting products. Of especial interest were the very high bursting strength of cedar, and the considerably lower values for Douglas fir and loblolly pine. In tear resistance the two latter woods were easily the leaders.

Although only two of the five species, western hemlock and eastern black spruce, are commonly used for sulfite pulping, all five were tested by this process for purposes of comparison. This necessitated the use of sodium base acid for pulping the Douglas fir and loblolly pine, to prevent burning of the cooks. Also higher maximum temperatures were necessary for the fir and cedar, which pulp very slowly at the normal temperature of 275° F. used for the other woods. An unexpected result was the great ease with which loblolly pine could be pulped when sodium base acid was used. Physical testing of the products showed that almost the same trends in bursting strength and tear resistance resulted from the sulfite pulps as had been the case with the kraft pulps. The pulp colors of the Douglas fir, loblolly pine, and cedar,

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which are not typical sulfite woods, are of interest. The fir pulp was olive in color when wet, turning brown on drying; cedar was a light kraft color; and loblolly pine a fairly dark gray.

Properties of Kraft Fibers

The fourth paper, "Specific Morphological, Chemical, and Physical Properties of the Kraft Pulp Fibers" was also given by Dr. H. F. Lewis, technical director of the Institute of Paper Chemistry, but he stressed the fact that he was acting as spokesman in reporting the work of a large group of men. The kraft pulps, which were prepared as detailed above, were subjected to many tests in an effort to determine why they form papers with different characteristics. Fir and pine fibers showed a greater average length than the other species, and also a slightly greater width. The number of fibers per gram were determined by Mr. Graff of the Institute, and these measurements showed that the fir and pine had about 20% less fibers per unit weight than did hemlock, cedar or spruce.

Slides were presented to show cross-sections of some of the woods. The distinct transition in size and wall thickness of Douglas fir in passing from springwood to summerwood was very evident. Pine also showed this property, while hemlock fibers in cross-section were not greatly different for the two types of structure. Douglas fir also differed from the other woods in having spiral thickenings in the fiber. Other slides demonstrated the distribution in fiber lengths and widths for hemlock and fir kraft pulps. The fir fibers are less pliable, and thus are not able to make as many fiber to fiber bonds in a sheet.

Chemical analyses showed that pulps were much the same in properties, mannan content being high in the spruce and fir, and xylan rather high in the spruce, pine, and cedar. The substance of the primary wall, which is very low to dissolve in cuprammonium, and produces haze in cellulose derivatives, was found to consist of mannose and glucose in the ratio of 3:1.

The specific surface of the fibers was shown to be proportional to sheet density and bursting strength, and inversely proportional to tear resistance. This fitted in well with the concept that these properties are dependent on the degree with which fiber to fiber bonds can be obtained in paper. Apparently molecular weight distribution of the cellulose molecules does not have a great effect on burst, for both pine and cedar showed similar curves. X-ray diffraction studies showed that fir fibers had a very high degree of preferred orientation of the constituent molecules, but at the same time loblolly pine showed very low orientation.

Compares Douglas Fir Fibers

The last paper of the session, "Comparison of Springwood and Summerwood Fibers of Douglas Fir," was presented by Dr. W. F. Holzer, assistant research director, Central Research Dept., Crown Zellerbach Corp., and program chairman

of the Fall Meeting. Douglas fir wood shows very prominent annual rings, with an abrupt change from springwood to summerwood. These two portions are quite different, the former being soft, with fibers of large diameter and thin walls, while the summerwood is quite hard for a conifer, and the fibers are very thick-walled. This suggested that comparison of the pulping properties of the two types of structure would be of great interest.

Springwood and summerwood chips were prepared by laborious hand-chipping procedures, and cooked separately in an autoclave. Summerwood kraft pulp appeared much more wooly and bulky than the springwood pulp, and handsheets prepared from the beaten stock had rough surfaces, low burst, and extremely high tear. Conversely, the springwood pulp gave hard, dense sheets with smooth surfaces, and showed high burst but low tear. Several samples were taken during beating tests for specific surface measurements. Of special interest was the fact that summerwood pulp beaten for 40 minutes showed, except for freeness and tear, almost identical properties to unbeaten springwood pulp, including density, specific surface, burst and fiber length. Some very interesting slides demonstrated the relationships between physical properties and beating time, and between physical properties and specific fiber surface.

Dr. Holzer's conclusion to his paper is worthy of direct quotation:

"The physical separation of Douglas fir springwood and summerwood fibers, even in 80% purity, indicates that pulps from this species at least, are a mixture

of two very different types of fiber. This type of study has been very little used, probably because of the tedious techniques involved in the separation. The results are, however, indicative of a method that might well explain some of the seeming anomalies in the behavior of various samples of wood even in the same species."

"One of Best Discussions"

The symposium was handled in an agreeably informal manner under the able chairmanship of Dr. Lewis. Because the papers were interrelated the discussion was reserved till the end of the session. A delegate from a western Canadian pulp mill asked Dr. Lewis whether the specific surface of fibers, which obviously had an important relationship to the strength properties, could be altered by mild chemical treatment. The chairman said there had not been time to investigate this possibility, but in the same connection Dr. J. d'A. Clarke, Longview consultant, averred that mild treatment was not feasible, since change in specific surface would require a change in the skin substance of the fibers, and this would entail drastic treatment.

Dr. Emil F. F. Heuser of LaJolla, Calif., retired Institute group leader on cellulose, took exception to the term 'skin substance', since, as he said, this is nothing more than the primary wall of the fiber. It does not permeate the fiber, as was originally thought. The primary wall is resistant to most treatments, but if it is removed, then the activity of the remaining fiber is greatly increased because it is more accessible to the reagents.

There then followed a spirited discussion of whether freeness had the significance which is usually attributed to it. Dr. Clark asserted that freeness was only a measure of the fine debris in beaten pulp, and that zero span tensile and sheet density had greater importance and showed better correlation to the normally tested strength properties.

A delegate from the east mentioned that work on pine wood similar to that reported by Dr. Holzer for Douglas fir had been done many years ago on a small scale, and that the results and conclusions were very similar. Trials were also made to see whether the two types of structure, springwood and summerwood, could be separated by partial pulping, since the softer ringwood might pulp faster. Unexpectedly, it was found that separation in this manner was not feasible, for penetration of the springwood by the liquor was slower than for summerwood.

This discussion was one of the most interesting that the writer has ever heard, and it was unfortunate that it had to be terminated because of lack of time. However, several possible directions which future research could take in the study of woods were pointed out, and it is most probable that valuable results will arise from the suggestions which were put forth.

ROBERT BUNDY, who has been promoted to Vice President in charge of operations for all Fibreboard Products, Inc., mills. He succeeded N. M. Brisbois, who has retired from active direction of the mills but will continue as consultant. Mr. Bundy, a graduate of University of Washington, was former Fibreboard Mill Manager at Port Angeles, later in Philadelphia and more recently has been general operating manager of mills. He lives in Menlo Park, Calif.



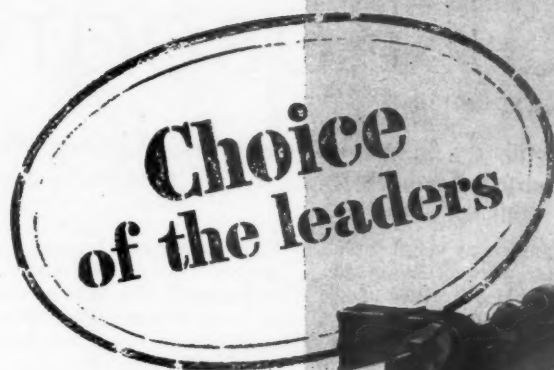
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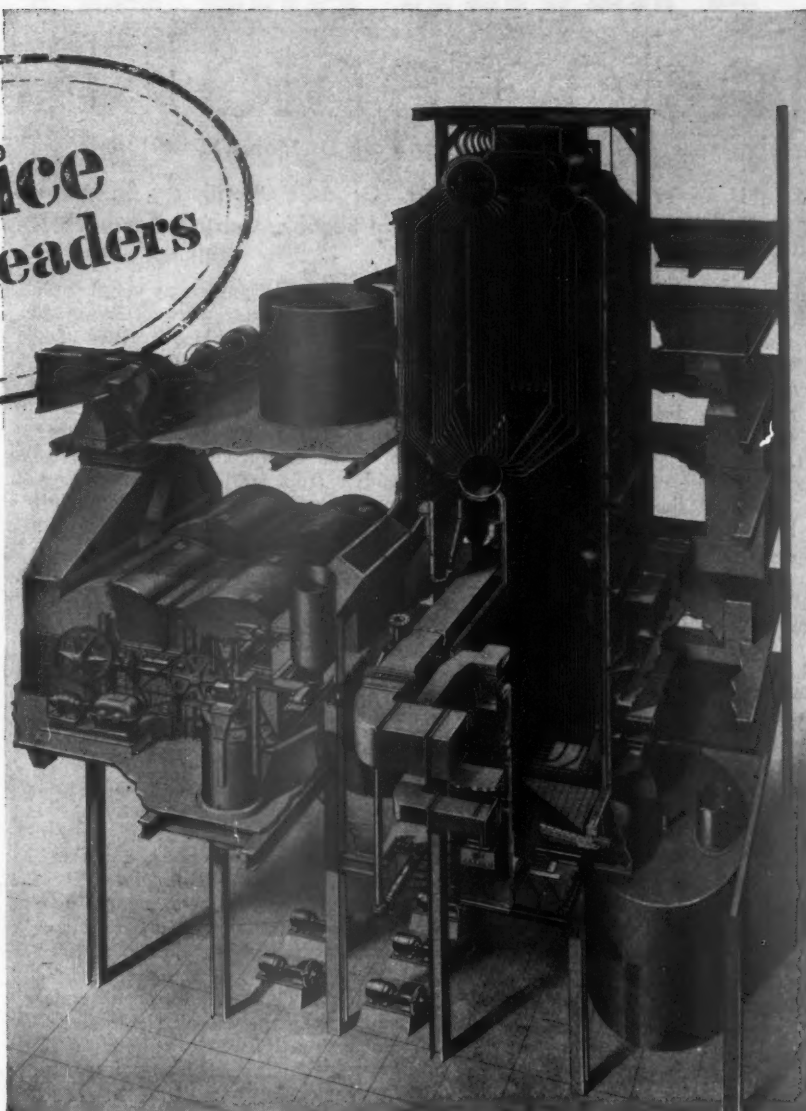
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A REVIEW AND APPRAISAL Fundamental Research

By Dr. John S. Barton

B.S., U. of Wash.; M.S. and Ph.D. (Organic Chemistry), Institute of Chemistry, Appleton, Wis.
Chief of Paper Products Development Section, Central Research Dept., Crown Zellerbach Corp.

The first paper of this session, "Report on Lignin Studies Under the Pulp Mills Research Project at the University of Washington," by D. M. Ritter and J. L. McCarthy, was in the form of a progress report and included a description of the extent and aims of this cooperative research effort.

"The Pulp Mills Research Project was established in 1944 at the University of Washington by about 20 pulp and paper companies located in the state of Washington as an instrument to aid in the development of methods by means of which the discharge of pulp and paper waste materials into water-courses and the atmosphere could be avoided. The investigation has been supported to the extent of \$50,000 to \$60,000 per year. One part of the research effort has been expended in study of methods which might be immediately applicable for the disposal or utilization of such materials as sulfite waste liquors and the kraft mill odor substances; some of these results have been reported in the literature and other work is in progress.

"The second part of the research effort has been concerned with the longer term of development of additional useful facts concerning lignin—its removal from the wood, its purification and chemical characterization, its derivatives and conversion products, and its utilization. Study has been devoted to lignin sulfonic acids from sulfite waste liquors, and also to sulfur-containing lignins similar to those available from kraft pulping waste liquors. Methods suitable on a laboratory scale for purification of some of these lignins have been evolved. Their empirical composition as available from Pacific Northwest woods has been determined. Several new methods for characterization of lignins have been worked out and are being applied to lignins isolated under different conditions. Some chemical derivatives of these lignins have been prepared and their properties are being determined. Lignin reactions which may prove to have industrial and theoretical significance are being studied."

Chemicals From Sulfite Liquor

Any news concerning the production of potentially valuable organic chemicals from sulfite waste liquor is news indeed. A research team of the Central Research Department, Crown Zellerbach Corp., announced "A New Method of Isolating Conidendrin from Sulfite Waste Liquor" in the second paper of the series. Messrs. H. B. Lackey, W. W. Moyer, and W. M.

Hearon reported an amazingly simple and ingenious process for recovering in a practical manner sizeable quantities of a pure organic chemical that had been previously regarded as a laboratory curiosity in every sense of the word.

"The literature reports only solvent extraction as a procedure for removing conidendrin from sulfite waste liquor. A new procedure has not been found to isolate conidendrin by precipitating it from sulfite waste liquor through the addition of certain organic liquids. The product so obtained represents essentially all the conidendrin present in the liquor, and is of good quality. The advantages of this new isolation method are the simplicity of operation, purity of the product and possibility of working with large volumes of liquor without elaborate equipment. The possibility of utilizing this method of isolation commercially has been demonstrated in a small semi-works plant.

"A study of the variables concerned with the precipitation of conidendrin from sulfite waste liquor has been made. These variables include the pH, concentration and temperatures of the liquor, and the identity and amount of the precipitating organic liquid. The optimum performance was achieved by the use of trichloroethylene amounting to 2.0% by volume of the sulfite waste liquor as it comes from the digester, cooled to room temperature.

"The possible usefulness of conidendrin has been explored. As such, conidendrin has not yet found industrial application, however derivatives of it have shown promise as commercial antioxidants and for pharmacological uses."

Measuring Fiber Surface

Turning from organic chemical research to the physical chemistry side of the fundamental session, J. C. Brown, Jr., The Institute of Paper Chemistry, Appleton, Wis., reported on the "Surface Area of Fibrous Materials by the Air Permeability Method."

A fundamental study of this type takes on added significance when one is cognizant of the fact that the mechanical and optical properties of a paper sheet are directly or indirectly dependent on the exposed surface area and fiber-to-fiber bonded area of the pulp fibers.

"... the area actually used for fiber-to-fiber bonding is probably the more significant quantity. A method of measuring the exposed surface area of the unconsolidated fibers in a pad, for comparison with that of the fibers in a sheet of paper,

should serve as a means of estimating the surface area utilized for bonding in the paper sheet. The fluid permeability method for determining specific surface of particulate material, which has found use in the field of fine powders, is used in the present study, with air as the permeating medium. Calculations are based on the Kozeny equation as modified by Carman to allow for the effect of 'slip.'

"Permeability data for pads of dry unconsolidated fibers, both beaten and unbeaten, were obtained over the porosity range 0.37-0.90. Values of specific surface and of the bed constants (k , k_s , L/L_0) were calculated from these data, and compared with values obtained from permeability data for handsheets prepared from the same West Coast bleached sulfite pulp. Calculations, using a pore shape factor (k_p) of 3.0, indicate that the exposed specific surface of the unbeaten fibers is 3800 sq. cm./g. That of the normal handsheets from the same unbeaten pulp is about the same, indicating that the area used for fiber-to-fiber bonding is negligible. For the pulp beaten to a freeness of 610 cc. Schopper-Riegler, the fibers have an exposed specific surface of 6750 sq. cm./g., while that of the normal handsheet is about 4850. Assuming that the difference between the exposed specific surface of the unconsolidated fibers and of the normal handsheets, as determined by the air permeability method, is a fair measure of the area used in bonding, this bonded area is of the order of 25-35 per cent.

"For pulp fibers, the Kozeny factor (k) is not constant, but increases with decreasing porosity; the pore shape factor, however, appears to be relatively constant over the porosity range of 0.37-0.90."

Cellulose Structure Studies

O. Goldschmid of Rayonier, Inc.'s Central Research Laboratory in Shelton, Wash., summarized "Recent Developments Relating to the Fine Structure of Cellulose Fibers" in the fourth paper.

As more refined tools and technique become available, the micellar and crystalline structure of cellulose becomes less of a mystery. This paper is a review of recent studies of the crystalline—amorphous structure of cellulose by Nickerson, Mark, Hermans, Howsmon and others.

"Recent modifications of the methods upon which the present picture of cellulose fine structure is based, X-ray defraction and accessibility measurements, indicate that in addition to the amount of crystal-

SULPHUR

***Interesting Facts Concerning This Basic Raw Material from the Gulf Coast Region**

***MINING**




The process of mining sulphur, as developed by Herman Frasch, takes advantage of the fairly low melting point of sulphur (about 240° Fahrenheit). The process resolves itself into three parts: one, operating a power plant that heats and pumps to the field large quantities of water; two, distributing the hot water through wells to melt the underground sulphur, and raising the melted sulphur to the surface; three, cooling and solidifying the sulphur in large vats from which it is broken and loaded into cars for shipment.

The power plant and water reservoir, as well as the vats and permanent structures, are placed at some distance from the sulphur deposit to avoid possibility of damage from surface subsidence, resulting from extraction of the underground sulphur.

Loading operations at one of the huge vats of Sulphur at our Newgulf, Texas mine. Such mountains of Sulphur are constantly being built at our mines, from which shipments are continually made.



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Mines: Newgulf and Moss Bluff, Texas

line and amorphous material, the size of the crystalline is of great importance for a better understanding of this structure."

It is shown that this work has led to a better understanding of the discrepancies between the results of the crystallinity determinations by the X-ray and the chemical accessibility methods, thus providing a more accurate estimate of the amount of crystalline material in a given sample. At the same time, these studies have led to another problem, the determination of the size of the crystalline regions. Estimates of the crystallite size by the limiting DP technique are discussed, and it is shown that the size appears to vary depending on source and pretreatment of the cellulose. Crystallite sizes obtained in this manner are in good agreement with those determined by direct measurement of electron micrographs of particles of acid-hydrolyzed cellulose by Morehead and by Ranby and Ribl.

A picture of the supermolecular fine structure of cellulose consistent with the experimental evidence is discussed, and it is shown that this picture provides a good basis for the interpretation of the properties of acid-degraded cellulose fibers and of the reactivity of different types of cellulose in various reactions of technical importance.

Continuing the discussion of the microstructure of cellulose fibers, G. J. Ritter of the Forest Products Laboratory gave the concluding paper of the fundamental research session entitled "Microscopical Determination of the Arrangement of the Cellulose Crystallites in Basswood."

The report presented microscopical data, in the form of photomicrographs, on the arrangement of the planes of the indices of refraction of the fibers and the ray cells in wood and also X-ray data on the arrangement of the cellulose crystallites in the fibers and the ray cells.

"A correlation of the microscopical and the X-ray data indicates that the high refraction index plane is parallel to the lengthwise direction of the cellulose crystallites in both the fibers and the ray cells. By knowing the relationship between the two types of data, it is possible to determine the orientation of the cellulose crystallites in cellulose specimens microscopically and thus avoid the preparation of X-ray specimens.

"Photomicrographs in black and white and in multicolors taken in polarized light indicate that the cellulose crystallites in the fibers are arranged, in general, with their long axis parallel to the long axis of the fiber and crosswise to the long axis of the ray cells.

"Shrinkage of cellulose material or wood during drying occurs at right angles to the long axis of the cellulose crystallites in parallel arrangement. Accordingly, fibers should shrink most in their crosswise direction and ray cells in their lengthwise direction. These theoretical predictions on shrinkage of these two structural wood elements are confirmed by actual microscopical measurements.

"Radial shrinkage of wood ranges from

50 to 60% of the tangential shrinkage; the discrepancy between the two types of shrinkage, in the past, has been explained on the basis that ray cells do not shrink lengthwise, which is the radial direction of the wood, and thereby greatly restrain radial shrinkage. In the light of the crosswise crystallite arrangement in the ray cells, the preceding explanation for less radial than tangential shrinkage of wood is apparently in error."

COAST MEETINGS—TACOMA OCT. 25

The Pacific Coast Technical Section holds its first 1949-50 series of meetings in Tacoma, Wash., Tues., Oct. 25 beginning at 2 p.m. at The Towers, with dinner there.

Lee F. Maybach, instrument engineer, Crown Zellerbach, Camas, will be moderator. S. P. Strayer, St. Regis, Tacoma, is handling arrangements.

The Coast Superintendents Division and Coast Technical Sections will hold a joint meeting at Longview, Wash., Tues., Dec.

Bill Damon Moves

William E. Damon, Pacific Coast representative of Orr Felt & Blanket Co., has moved to a new address in Camas—209 Riverside Ave., in Midland Acres. The four-acre place includes a fishing hole for the Damon children, Billy and Susie.

In October, Mr. Damon is meeting Norman Scott, sales manager of Orr Felt, in Los Angeles and they will tour the mills.

6. The Superintendents elect new officers. The session will be on papermaking and converting, with Carl Fahlstrom, Longview Fibre Co., as moderator and Svarre Hazelquist, Weyerhaeuser, and Fred Armbruster, Dow Chemical, handling arrangements.

Other meetings:

Tues., Feb. 7, Everett, Wash., Engineering.

Tues., Apr. 7, Camas, Wash., Shibley contest.

Research Trends in CELLULOSE AND WOOD PULP

(Summary of his paper presented at Portland, Ore., Technical convention Sept. 15, as written by Dr. Heuser for PULP & PAPER.)

By EMIL HEUSER,
Previously Research Associate and
Leader of the Cellulose Division With the
Institute of Paper Chemistry.

An attempt is made to point out the preferred subjects on which fundamental research is carried out and the results obtained, concerning cellulose in general and certain phases of wood pulp technology. In the field of fundamental research on cellulose, the desire to clarify the submicroscopic structure of the fiber is unabated, and much progress has been made in the elucidation of the fibrillar structure of the fiber by making use of new techniques in the field of electron microscopy. These results show that the gap between what the light microscope reveals to the eye and what X-ray analysis allows us to deduct is becoming narrower all the time.

Of similar interest as the elucidation of the fibrillar nature of the fiber is the ratio of the amorphous to the crystalline portions, which varies with the type of fiber or, having more practical purposes in mind, the "accessibility" of the various fibers to reagents. Much work has been done in recent years to perfect the methods for determining this important property of the fiber and to narrow down as much as possible, the discrepancies between results obtained with different methods. Next to be considered is the molecular weight of cellulose, that is, its average chain length, as it exists in the original plant and, further, its chain-length distribution and how these characteristics change when the cellulose fiber is isolated from the plants and purified to suit present-day technological requirements. Much other research, which likewise concerns the molecular structure, centers around the question of the presence or absence of weaker bonds, that is, other than the common β -1,4-glycosidic linkages which hold the single anhydroglucose units together. Such weaker bonds may be distributed either along the chains or laterally, between them. In this connection, the interest in the introduction of (synthetic) cross linkages into cellulose continues in various directions. Finally, a new, most promising field of fundamental cellulose research, namely the labeling of at-

oms of the cellulose molecule by the use of radioactive elements, seems just to have opened its gates. The new tool will be useful in the attempts to elucidate the mechanisms which are operative when cellulose is produced in the plant and when it is subjected to chemical reactions.

Wood Pulp Research

Turning to wood pulp, the dividing line between fundamental and applied research is not sharp. The importance of chain length and chain-length distribution as a useful means of learning more about the inner nature of wood pulp is being given increasing attention. In addition, it would seem that a great deal of the interest of the research workers in the pulp field centers around the necessity of having better methods for predicting how a given pulp will behave when put to actual use.

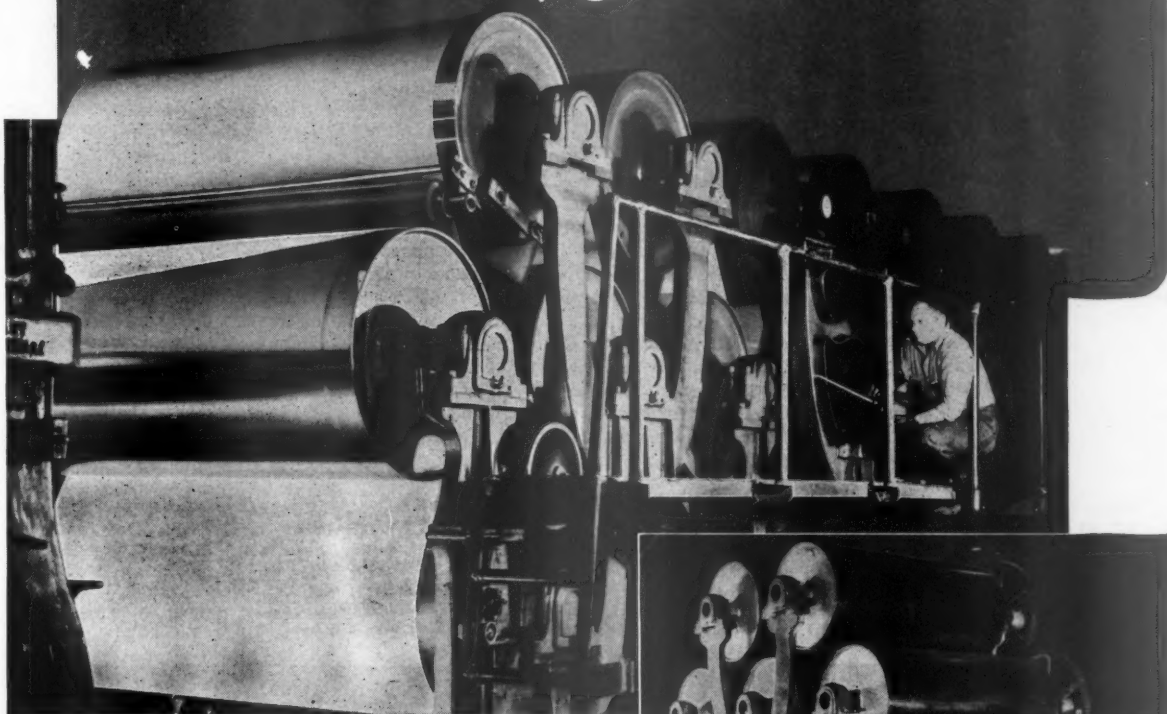
Most of the work on pulps for conversion concerns their behavior in the viscose rayon (and cellophane) processes, with particular interest in the filtering properties of the viscose and in the factors which influence this important property. Besides, the improvement of methods which permit to predict the behavior of the pulp during acetylation has had considerable attention. It would seem that some of the results, obtained by applying these new suitability tests to a great variety of pulps, have, in their turn, given a new impetus to the attempts to use, for conversion, not only sulfite but also sulfate as well as certain hard wood pulps.

Not much new research has been done on the mechanisms of the sulfite and sulfate cooking processes, although some excellent summaries have been presented. These furnish much food for thought and show where much needed knowledge is still lacking.

On the other hand, the painstaking and patient research of many years directed to the solution of certain highly important technical problems of pulp manufacture, including the bleaching and purification steps, has been rewarded with success.

Finally, the old problem of continuous cooking has found new interest, and some practical results are being achieved.

7 LUKENWELD DRIER ROLLS do the work of 10 ordinary rolls...

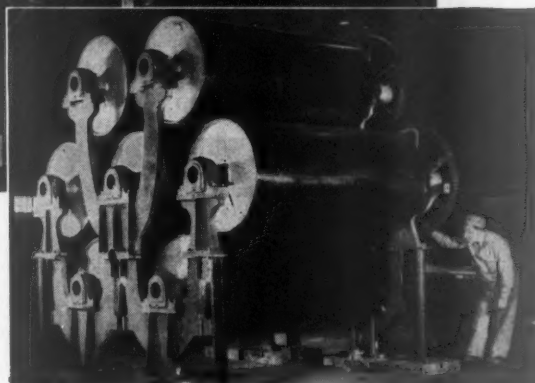


This drier section addition to a paperboard machine at S. Austin Bicking Paper Mfg. Co., Downingtown, Pa., packs a lot of production into a small space.

To increase the output from one of S. Austin Bicking Paper Manufacturing Company's paperboard machines, it was estimated that ten ordinary single-shell rolls would be required. Our engineers determined that seven Lukenweld Jacketed Steel Drier Rolls would provide the desired additional drying capacity.

Lukenweld designed and built the drier section containing these seven rolls. Because fewer rolls were required, the unit takes up less plant space, the supporting structure was simplified and costs were reduced. The welded steel frame is strong and rigid, helping hold down upkeep costs.

Lukenweld Jacketed Steel Drier Rolls owe their superior performance to these properties: Narrow passages force high-speed steam circulation and positive scavenging. Being of steel plate construction, sections can be thinner, assuring



Erecting the drier section at Lukenweld.

rapid and uniform heat transfer. These rolls can be safely worked at high steam pressures—up to 350 psi and higher.

Manufacturers interested in increasing the output from old or new machines can obtain help from our engineers. Bulletin 358 tells you more about Lukenweld Jacketed Steel Drier Rolls; Bulletin 505 gives actual case histories on applications in various industries. For copies, write Lukenweld, Division of Lukens Steel Company, 444 Lukens Bldg., Coatesville, Pa.

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INDUSTRY CONFERENCE

IS HELD IN ADIRONDACKS

More than 125 top executives in the pulp and paper industry of the east and southeast met Sept. 12-13 with General Electric officials at Adirondack Inn, Sacandaga, N. Y., to discuss modern phases of electrification, and other mutual industry problems.

Arriving by car, train and plane, the mill men were met at Schenectady's Hotel Van Curler and motored to the famed Adirondack resort on Sunday evening in glowing autumn weather that promised well for a competitive sports program that was a part of the two-day session.

Emphasis, however, was definitely on mill problems that included marketing, finance, purchasing, employee relationships, materials handling, and general mill modernization. Even atomic energy as a power source was discussed, but of more immediate interest was the session on the gas turbine. This subject was easily one of the liveliest in the program

and the most provocative of discussion.

Although G-E officials would not confirm **PULP & PAPER'S** query at this time, it seemed probable that this conference would be one of others, either at Sacandaga or other points. Certainly the success of this one would point that way if transportation and general conditions make it practical.

"Electrical Conference"

Termed a "Paper Industry Electrical Conference" to "plan for mutual progress" the program featured such industry and allied leaders as Reuben B. Robertson, president of Champion Paper and Fibre Co., and ex-president of APPA; G. W. E. Nicholson, vice-president and general manager of Union Bag & Paper Corp. and former president of the industry's technical association; A. P. Schnyder, Ebasco Services, Inc.; and J. B. Eakin, purchasing agent, St. Regis Paper Co.

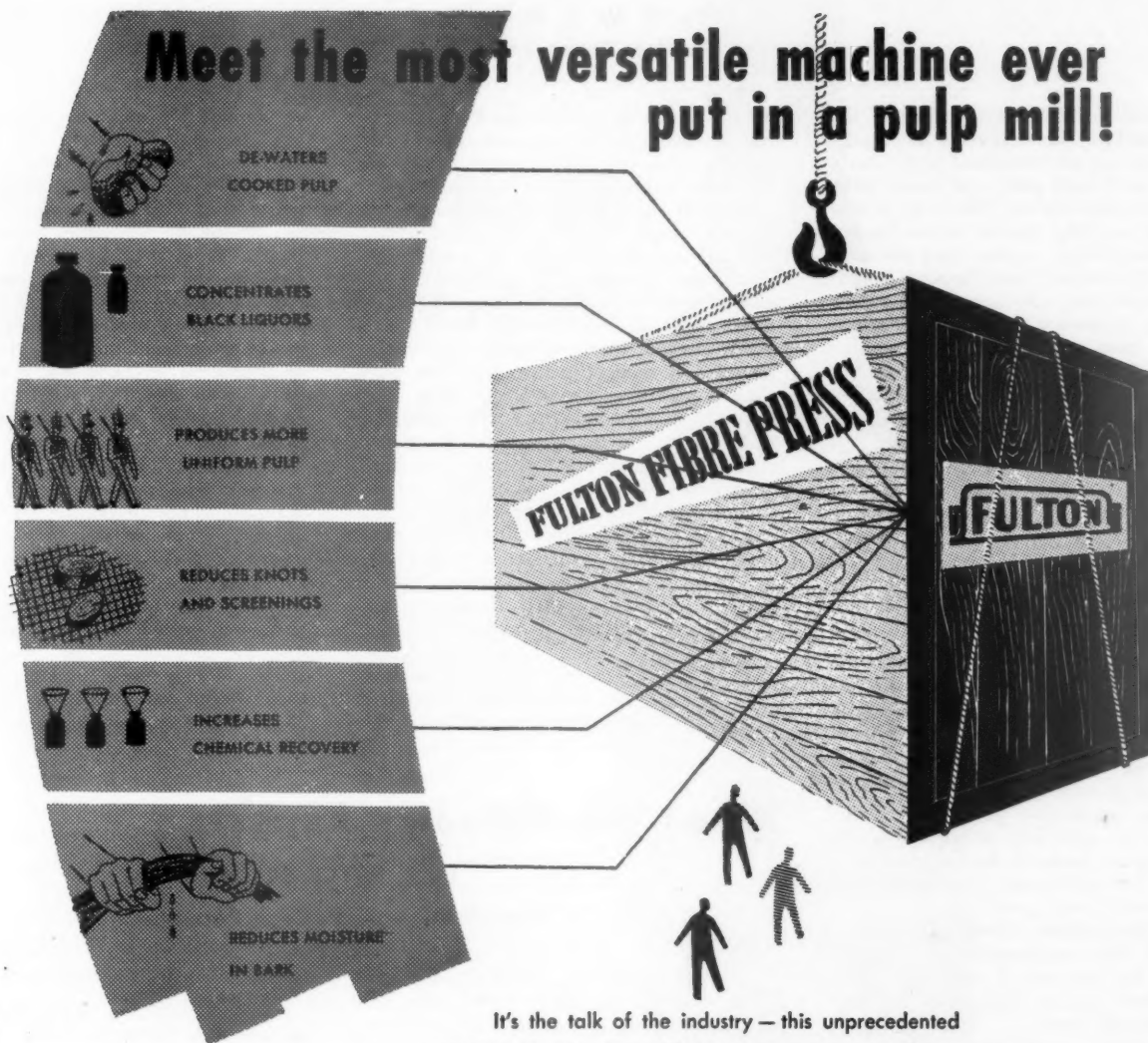
Among G-E officials participating and acting as hosts to the mill executives were: C. H. Lang and H. L. Erlicher, vice-presidents of G-E; C. L. Kenyon, manager of the credits and collections division; W. V. Merrihue, manager of employe and community relations; W. C. Bloomquist, industrial engineering division; D. L. Beeman, manager of industrial power division; G. W. Knapp, manager of the paper division; G. E. Shaad and W. Mikelson, of the paper division; D. H. Putnam, manager of sales of the lumber and paper industry and secretary of G-E; W. V. O'Brien, general sales manager of the apparatus department; K. R. Ross, manager of manufacturing industries division; A. K. Bushman, manager of application and service engineering; and H. A. Winne, vice-president in the executive department.

Following are briefs of some of the discourses during the two-day meeting (others will be published next month):

ACTIVE DURING G-E's Sacandaga, N. Y., Meeting were (left to right, top row): REUBEN B. ROBERTSON, President, Champion Paper & Fibre Co.; J. B. EAKIN, Purchasing Agent, St. Regis Paper Co.; K. H. RUNKLE, Manager, Industrial Divisions, G-E Apparatus Dept.; C. H. LANG, V. P. in Chg. of Sales, G-E Apparatus Dept.; and H. L. ERLICHER, V. P. in Chg. of Purchasing, G-E. Bottom row: M. S. FOGERTY, Chief Engineer, Sutherland Paper Co.; J. W. ROBERTS, Manager of Methods, Johns-Manville; E. F. BEARCE, V. P. of Chillicothe Paper Co.; and reviewing their golf scores, J. H. FORD, Chief Engineer, Container Corp. of America; J. McWILLIAMS, Plant Engineer, Byron Weston Co.; and F. M. ROBERTS, Ass't. Mgr., Industrial Engineering Div., G-E Apparatus Dept.



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MODERN TRENDS IN KRAFT

By G. W. E. Nicholson,
Vice President, Union Bag & Paper Co.

I shall briefly outline some of the more important developments in equipment as applied and practiced in the more recently built kraft pulp and paper mills in the Southern states. Starting in the woodyard, we find Diesel motor driven electric locomotive cranes used for unloading of pulpwood from railroad freight cars to conveyors; also large stackers for stacking of pulpwood into large individual pulpwood piles, and a system of water sluices for transferring wood to the barking drums and the wood room. Rubber belt conveyors are also being used for transportation of pulpwood.

In the woodroom we will see multiple knife chippers making a uniform quality of chips going to a series of cylindrical chip silos for storage of a large supply of chips. The digester room has been completely equipped with automatic cooking control, eliminating the judgment of the operator almost entirely, and the operation of all blow valves and liquor valves is by means of push-button control. There is every reason to believe that we will see continuous cooking introduced during the next few years.

Continuing through the plant we will find several new designs of pulp screens taking less space, less power and producing more uniformly screened pulp.

The progress made in design of equipment used for recovering of chemicals and heat has been very great during recent years, bringing about a very greatly reduced salt cake consumption to a figure below 100 lbs. per ton of pulp, and with a steam generation as high as 10,000 lbs. per ton of pulp made.

We also note a great number of labor saving devices, such as pneumatic unloading of salt cake and other chemicals to storage silos, and also a great number of electric battery operated trucks for handling various raw materials and chemicals.

In the paper mill we will see that the refining equipment such as Jordans, beaters and disc refiners, is arranged for continuous flow of pulp. Paper machines used are mass production units with a daily machine production as high as 700 tons of finished product at an operating speed up to 1,600 f.p.m. and a great deal of development work has been carried out on the Fourdrinier paper machine and auxiliary equipment during recent years. Application of high vacuum on paper stock before it enters on the paper machine will assist the paper formation and drainage on the wire. This is another development which I believe we will see more of very shortly. Double couch rolls, as well as double suction boxes in couch rolls are other valuable improvements for better steam economy and increased paper machine speeds. Introduction of high velocity heated air for increase of evaporation of water from the sheet and the

dryer felts is in general use to help drying economy. Improved reel and winder designs have contributed very greatly to bring about higher paper machine speeds.

A great deal could be said about the modern paper machine drive of today and particularly the great progress made in the development of a dependable high speed electrical sectional drive using electronic control. And recent years have brought about great advances in the application of modern instrumentation.

Some of the larger kraft pulp and paper mills use more than 500 recording instruments and in many cases these instruments automatically control the operation of the equipment in the various departments. The time will come when pulp and paper making will become continuous processes controlled and operated by means of instrumentation.

The maintenance cost of plants has been greatly reduced by extensive usage of noncorrosive materials, such as stainless steel, monel metal, tile and asbestos in the design and installation of equipment. Application of modern methods and

equipment for gas and electric welding has also played a great role in the reduction of maintenance cost.

Considering the large quantities of steam and electric power required per ton of finished product, you will find that a great deal of thought has been given to the application of the most recent developments in steam and power generation and distribution, such as the use of boilers and topping units at steam pressures up to 1,250 lbs. and temperatures up to 950° Fah., with generation of electric power at voltages as high as 13,800 volts.

I believe I am correct in saying that the pulp and paper industry is in the unique position among major industries in our country in that it ranks first in power used per ton of finished product, approximately 700 K.W.H., and third in installed generating capacity of 1,600,000 K.W., and considering the great possibilities for application of practically all phases of new development in the electrical field, our industries will always be very closely tied together.

What the Industry Expects

By J. BRYCE EAKIN,
Purchasing Agt., St. Regis Paper Co.

In looking over the meeting program, I found my topic was presented in the form of a question. "What the Paper Industry Expects from the General Electric Company." It is my belief that quality, price, service and cooperation is the foundation for the most beneficial relations, between purchasers on one hand, and manufacturers on the other.

Humans like to do business first with people or organizations with whom they have established friendly relations. There is no better way in my estimation of establishing yourself on friendly terms than by making available quality products, fair prices, and unexcelled service, mixed liberally with close cooperation and mutual assistance.

Such practices were not easily maintained during the war and immediate postwar years because of allocations and shortages. Even now, with the return of the buyers' market, many organizations have not learned the necessity of utilizing this policy in their merchandising efforts.

In order to clarify my purchasing policy and what we expect from General Electric and other manufacturers, let me cite for the moment St. Regis Paper Co. as an organization. We are composed of three major divisions, with plants and mills located throughout the United States, and in such other countries as Canada, South America and Puerto Rico. Through our International Division we work closely with licensees in 34 countries.

We require annually hundreds of thousands of dollars worth of equipment, products and services to keep our plants and mills operating. In the past 18 months we made substantial purchases from General Electric and other

manufacturers for our new kraft paper mill at Tacoma.

We should be able to obtain highest quality equipment to minimize costly breakdowns. And when breakdowns do occur, I believe we can expect from the manufacturer replacement parts — which he should stock — readily available and installed with a minimum of lost production time. The manufacturer also should maintain regular service calls to plants and mills where his equipment is installed to prevent breakdowns by detecting weaknesses and failures before they occur.

The time has come also when the larger manufacturers must realize they are not the only "hens on the roost." It is possible today to buy from reputable but smaller manufacturers equipment and supplies of the same quality, and frequently at a lower price.

We can, in my opinion, expect price quotations that will not leave us unprotected over 90 days in event your costs go down, or we are able to buy at a lower price elsewhere. Any other policy, I believe, is unfair. In the final analysis, you like ourselves must be competitive in today's market.

We must in our day-to-day operations rely on technicians and salesmen to supply us with the necessary information on products so that with full knowledge we can place our purchase orders in a most intelligent manner. Once an order is placed, it should be the responsibility of the vendor to keep us informed through prompt confirmations the status of that order.

Lastly, to be completely effective in our relations with suppliers, and conversely, suppliers with St. Regis Paper Co., there should be a closer tie-in — call it cooperation, mutual assistance, or what you will — between the manufacturer and St. Regis.

New

MOORE & WHITE

Rotary Steam Joint

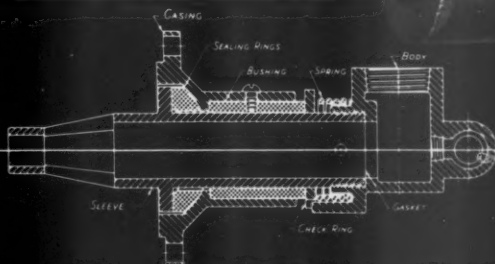
weighs only 12 pounds!

This improved, extra-light Rotary Steam Joint is expertly engineered and precision-built. Low in cost, it will give years and years of satisfactory service. It is made from a special aluminum alloy, treated to Moore & White specifications, and weighs only 12 pounds—as compared with the conventional joint weighing up to 90 pounds. No supports are necessary. It is simple in construction—extremely easy to handle and install. Just bolt it to the end of the dryer journal and make the necessary connections.

The Moore & White Rotary Steam Joint needs no lubrication. Graphite bushings are held in place by screws designed to prevent binding of the sleeve. This assures a steam-tight fit, and eliminates leakage. The joint is made to withstand up to 400 pounds test pressure, several times the maximum pressure used.

Call or write us for further information concerning this major Moore & White contribution to paper-making efficiency. If you desire an estimate, please supply the following data:

- 1:** Diameter of end of dryer journal. **2:** Diameter of hole in journal. **3:** Bolt circle and size of bolts.
- 4:** Diameter of steam inlet. **5:** Diameter of exhaust pipe. **6:** Size of siphon pipe.



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HIGHER MILL EFFICIENCIES And The Gas Turbine

by W. C. Bloomquist
Industrial Engineering Div., General Electric Co.

In these days of stiffer competition, higher break even points, higher labor costs, and higher fixed operating expenses, the controllable expenses such as steam and power, become a more important part of the Profit and Loss statement.

Cost of steam and power for paper mills ranges from 10 to 20% of the cost of the product—a good average is around 15%. Even though this is a small part of the total, the mill fixed expenses are high so even a few percent saving in fuel and power exerts a leverage action on the net earnings of a company.

With the exception of hydro mills, we can think of this 15% cost as fuel and that is the easiest to translate into dollars.

It is not only important that the mill operation be in balance—heat balance as we engineers call it—but also that the mill fuel rate be the lowest.

What can mills do to reduce this controllable expense—fuel? A few things are:

1. Recovery of waste heat.
2. Selection of higher pressures and temperatures for steam turbine generators.
3. Use of topping and extraction steam turbines when applicable. It is not unusual to get 20-40% more kilowatts for the same plant steam requirements.
4. Proper selection of equipment such as mechanical vs. electrical drives; gas turbine vs. steam turbine.
5. In some mills it may be cheaper to purchase some power than generate all.

I knew I couldn't cover all of these topics so I selected the gas turbine, not because it is a popular topic but because it offers the paper mill a way to reduce the cost of steam and power. And, also, because so little information is available regarding this new application.

The gas turbine has had a lot of publicity the past few years particularly for aircraft use.

In 1680 Bishop Wilkins presented in his book, "Mathematical Magick", an idea for what is probably the first gas turbine. His claims for his gas turbine were that it was suitable for: "Turning a spit, reeling of yarn, the chiming of bells, the rocking of a cradle, and other diverse domestick functions". These are probably the last uses we would now make of a gas turbine.

Around the turn of the century a Frenchman built a fairly good size gas turbine along present lines, but it was not practical as all of the power developed by the turbine was required to drive the

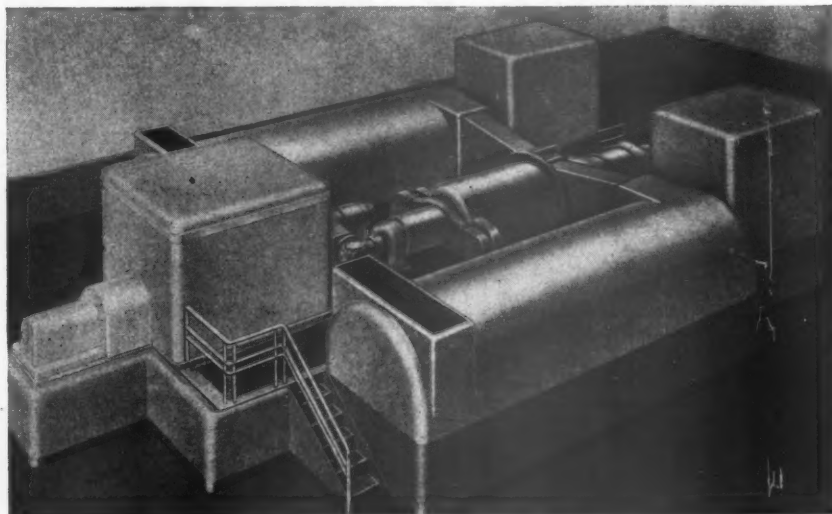


Figure 1

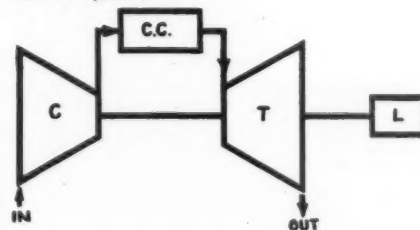
compressor. In present gas turbines about $\frac{2}{3}$ of the power is required for the compressor and $\frac{1}{3}$ net is available for the load.

During intervening years, the efficiency of both compressors and turbines were increased and with the introduction of high temperature materials the gas turbine became practical.

All major turbine manufacturers in this country have designed or are building gas turbines. We now have two units in operation, plus one ready to fire in a couple of weeks, and 5 on order and being built.

Figure 1 illustrates a 5000 KW Power Plant.

How It Operates



SCHEMATIC DIAGRAM
SIMPLE GAS TURBINE CYCLE

Figure 2

A few words on how a gas turbine operates before getting into the application. First, however, there are two types of gas turbines; one the "flow type—your steam turbine is of this type and is really a gas turbine since steam is a gas.

The other type—and what we generally

think of when we speak of a gas turbine is the so-called "combustion" type.

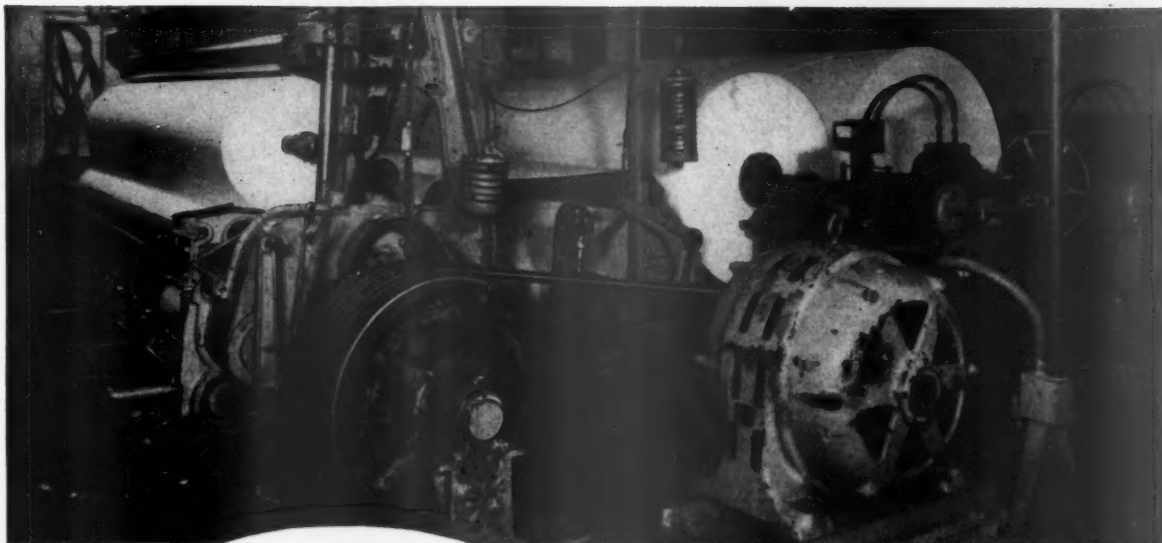
Figure 2 is a schematic diagram of a simple gas turbine cycle such as used in the OG&E and locomotive units. Air is compressed in the compressor to about 15 lbs. and then passes into the combustion chamber where fuel is injected and burned. The hot gases then expand thru the turbine doing work.

The hot exhaust gases from the turbine contain a lot of heat which can be used to produce steam in a boiler, used directly for drying, or, to heat compressed air and thereby reduce fuel consumption.

General applications of gas turbines are similar to steam turbines, depending upon the type of unit; that is for power generation only or for power generation plus process heat.

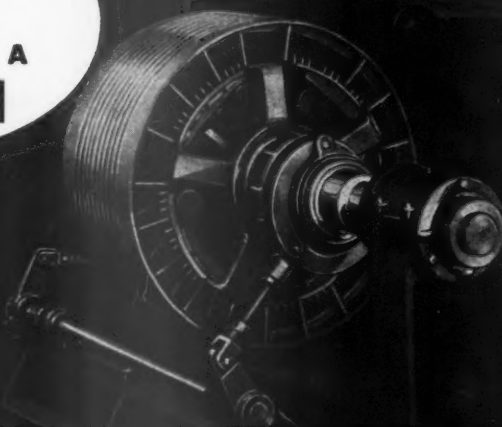
Rather than talk in generalities, I'd like to take you thru an actual proposition we are working on for a gas turbine for a paper mill.

Incidentally, while reviewing some of this material with one of our men he noticed the word "efficiency" in some of my calculations. He told me that if I used that word those of you who represent management wouldn't know what I was talking about and I'd miss my objective. I'm sure it isn't as bad as all that. To engineers efficiency values are a good reference or bench mark as they tell us how good or bad an operation is. You, likewise, have your reference points—such as tonnage output for a given size machine, or the various ratios in the Balance Sheet and Profit and Loss statement to tell you how healthy your business is. Therefore, I'll use efficiency as a reference value—to tell what it means in terms of the fuel dollar. In other words, for every



6

ADVANTAGES OF A HORTON



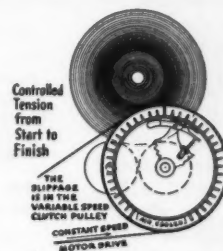
- 1
CONTROLLED TENSION
- 2
SHOCKLESS STARTING
- 3
SMOOTH ACCELERATION
- 4
EASY THREADING AND INCHING
- 5
LOW MAINTENANCE
- 6
FRACTIONAL TO 250 H.P.

HORTON MANUFACTURING COMPANY

Manufacturers of
HORTON VARIABLE SPEED CLUTCH PULLEYS
HORTON GOVERNOR CONTROLLED BRAKES

3012 UNIVERSITY AVENUE S. E. • MINNEAPOLIS 14, MINN.

October, 1949



Write today for information and specifications on the Horton Variable Speed Clutch Pulley that gives the turning torque to the roll when winding and permits variable speeds when starting new rolls or when slower speeds are required for winding poor mill rolls.

It is also used where quick, smooth starting and stopping and fast, smooth acceleration are required.

dollar spent for steam and power, how much is useful output?

Figure III shows over-all efficiencies & established reference values.

Example No. 1

(Paper mill—power and process steam)

Figure IV is a simplified diagram showing only basic features.

Turbine is of the simple type utilizing heat of exhaust gases to produce steam in two boilers at two different pressures—175 No. G and 40 No. G. From the last boiler gas goes thru an economizer to heat feed water for the boilers and then the gas goes up the stack.

You'll note the boiler output is relatively small in relation to power produced. This happens to be a conversion mill and you know that ratio is lower than for integrated mills.

Over-all thermal efficiency of steam and power production—a measure of the fuel dollars—is about 72%. You will recall, that maximum possible efficiency was 70-80% so you can see the gas turbine with secondary heat recovery is very attractive.

Now suppose we do the job with a condensing double-Extraction steam turbine instead of a gas turbine to produce the same kilowatts and steam. What efficiency can we expect? Only around 52% instead of 72% for the gas-turbine method. The reason the efficiency is poorer for the steam-turbine method is because the process steam requirements are low so most of the kilowatts have to be produced by the condensing section of the turbine at a thermal efficiency of about 20%.

Now let us translate these efficiencies into fuel dollars. In this mill location fuel costs 6c/gal. If we assume full load operation (and that is the most economical for gas turbine method) for 7000 hrs. per year, this better efficiency for the gas-turbine method means a fuel saving of about \$105,000 per year. But the fuel saving isn't the only thing in its favor. The investment will be less; this saving, comparing a new completely installed plant, will range from \$200,000-\$400,000. Also, some of the other operating expenses should be less such as labor and boiler maintenance. These boilers are of the non-fired type and the gas temperature is around 800F compared with 2500F and higher for conventional fired boilers.

This 6c fuel corresponds to \$11/ton coal. Coal would have to be \$8/ton for the steam turbine method for equal fuel costs. The gas turbine is not developed for coal—it uses either oil or gas.

Suppose process steam requirements are doubled; then how do the two methods compare? The over-all thermal efficiency is more nearly equal but slightly in favor of the gas-turbine method. Substantial improvement in the steam-turbine method is due to the fact that more power is produced as by-product power. Supplementary fuel is required for the waste-heat boilers of the gas-turbine method to meet the higher steam requirements and is included in the comparison.

Example No. 2

(Gas turbine using exhaust heat for drying heavy paper board)

In one proposition we have, a mill is considering using the exhaust heat directly for drying heavy paper boards. In this case the annual gross rate of return

RELATIVE EFFICIENCY SHOWING USEFUL FUEL OUTPUT

<u>POWER ONLY</u>	<u>% EFF.</u>
Average utility	22-28
Gas turbine	17-28
<u>STEAM WITH BY-PRODUCT POWER</u>	
Max. attainable	70-80
Paper mills	35-75

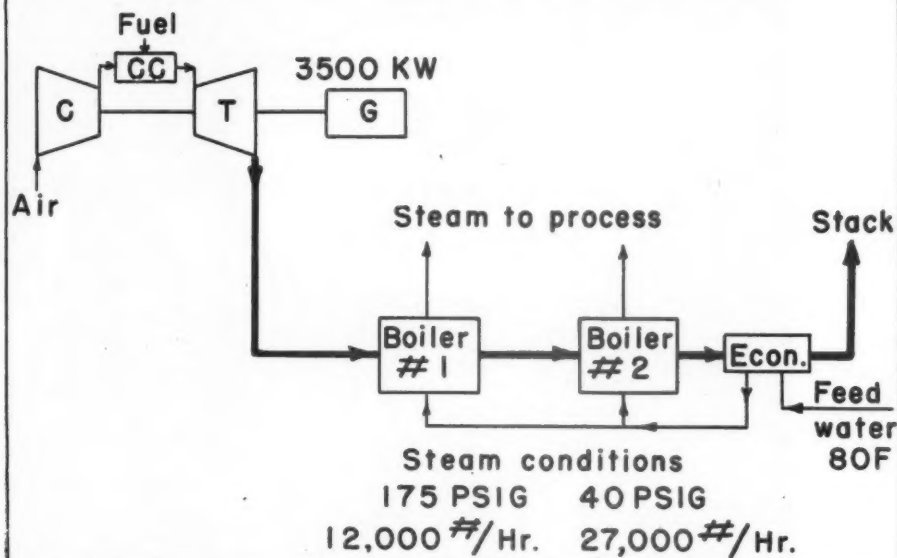


Figure III (Top) Figure IV (Bottom)

on the investment is around 40%. And that mind you for natural gas fuel that costs only 15c/million Btu or roughly the equivalent of \$4 coal.

Example No. 3

5000 KW Gas Turbine Power Plant
(No process heat)

If you have to generate power only or power that cannot be produced as by-product then the high efficiency power plant is attractive. This plant has an over-all thermal efficiency of 28% as compared with about 20% for a steam plant of comparable rating. Installed cost will be less; $\frac{2}{3}$ - $\frac{3}{4}$ that of a steam plant. Fuel costs will be about 70% of that of the steam plant due to the higher efficiency. And some other operating expenses will be less.

You can see that the gas turbine has its place in a paper mill. However, do not get the idea, based on these few case histories, that the steam turbine is on its

way out—that isn't so; these examples are favorable to the gas turbine. The steam turbine will continue to have many economical applications in paper mills.

Summary

In closing, I want to summarize a few points. 1. Part of the 15% cost of fuel and power is a controllable expense that may be reduced by: (a) Instituting heat-recovery methods; (b) Maintaining a heat balance between steam and power requirements. Changes in steam and power requirements will affect the heat balance so should be checked after major changes; (c) Proper selection of initial steam conditions for new turbines.

Fields for a topping turbine are: (a) Where additional kilowatts are required without a corresponding increase in process steam requirements; ie, where the electrical load growth is faster than the process steam; (b) Where old low-pressure boilers—typically the 200 lb. class—have to be replaced. Steam from topping turbine replaces that of the boiler.

3. The gas turbine has a definite place in a paper mill but it is not a universal solution. Each application should be thoroughly studied to determine the steam turbine or gas turbine is the proper selection.

SOUNDVIEW



High Grade
**BLEACHED
SULPHITE PULP**

SOUNDVIEW PULP COMPANY
EVERETT WASHINGTON



October, 1949



NORTHEAST

Tribute to Lockport Man

The late Edward J. Johnstone, for 18 years a sales engineer for the Lockport Felt Co., who died recently, was honored in a special resolution by directors of Lockport in praise of the contributions he had made to the paper industry.

Mr. Johnstone was born in Antwerp, N. Y., and was a graduate of Pratt Institute of Brooklyn. He was a navy lieutenant during World War I and before going to Lockport was associated with the Superior Chemical Co. in Holyoke, Mass.

T. L. B. Lyster, 70, former chief engineer of the Hooker Electrochemical Co., Niagara Falls, N. Y., died Aug. 18 of a heart ailment. At the time of his death, Mr. Lyster, a well known industrialist and art patron, was a consulting engineer for the Hooker company. In 1907 he came to the company as a construction engineer.

LOUIS CALDER, JR., son of Louis Calder, Sr., president of Perkins-Goodwin Company, New York, has joined the company in an executive capacity. A graduate of Princeton, and a veteran of air actions in the Pacific, Mr. Calder has been traveling throughout the pulp and paper industry preparatory to entering the internationally known firm.

FRANK J. LOVEGREN has been appointed stock preparation supervisor of W. C. Hamilton & Sons, Miquon, Pa. Recently with his wife and son, Lars, he vacationed in the Pacific Northwest and attended the technical meeting at Portland Ore.

KARL CLAUSON, secretary of the Association of Pulp Consumers, New York, was a busy man over the Labor Day holidays. He became a father for the third time—this was a baby daughter—and after making sure everything was proceeding normally he took the plane for London. He'll be overseas about six weeks.

"Pete" Heuer Manager Of Norfolk, N.Y., Mill

J. H. (Pete) Heuer has been appointed resident manager of the Norfolk, N. Y., mill of St. Regis Paper Co., Printing and Publication Paper division. He will continue as the technical director of the division. The laboratory is at Deferiet, 60 miles from Norfolk.

EMERSON D. OGLE has been appointed manager of industrial sales of SKF Industries, Inc. He succeeds C. D. Cummings, who has resigned.

SEVERAL HUNDRED PROMINENT INDUSTRY MEN, from both the mills and the equipment and supply firms, were guests of the Lukens Steel Co., Coatesville, Pa., Sept. 1, where these photographs were taken. The day's outing, which included visits to Lukens plants and was climaxed by a dinner, was one of a series which Lukens has been holding throughout the summer and fall, and attendance indicates the great interest in Lukens-weld jacketed steel drier rolls, as well as stainless-clad for combatting corrosion.

Top row (l. to r.)—E. A. Charlton, Consulting Engineer, New York; Jesse F. Goad, Mill Supt., Hinde & Dauch Paper Co., Gloucester City, N. J.; John Moran, Engineering Section, Stevens and Wood, Inc., New York; W. D. Wendi, Plant Manager, Hinde & Dauch Paper Co., Gloucester City, N. J.; J. H. Matthews, Vice President, Raybestos-Manhattan, Inc., Passaic, N. J. with John F. Maguire, Development Engineer, Lukens Steel Co., Coatesville, Pa.

Bottom row (l. to r.)—R. S. Brookover, Supt., Crown Paper Board Co., Inc., Philadelphia; Arthur C. Bird, Hardy S. Ferguson and Co., New York; A. H. Gridley, Chief Engineer, Hardy S. Ferguson and Co.; L. A. Baldwin, Vice President, Industrial Dept., Johns-Manville Sales Corp., N. Y.; D. L. Horgan, Development Engineer, Lukens Steel Co., Coatesville, Pa., with George L. Snyder, Asst. Mgr., Development Engineering, Lukens Steel Co.



One of the Men behind Eastwood Wires

James Dorney

Whose work is always "on the beam"

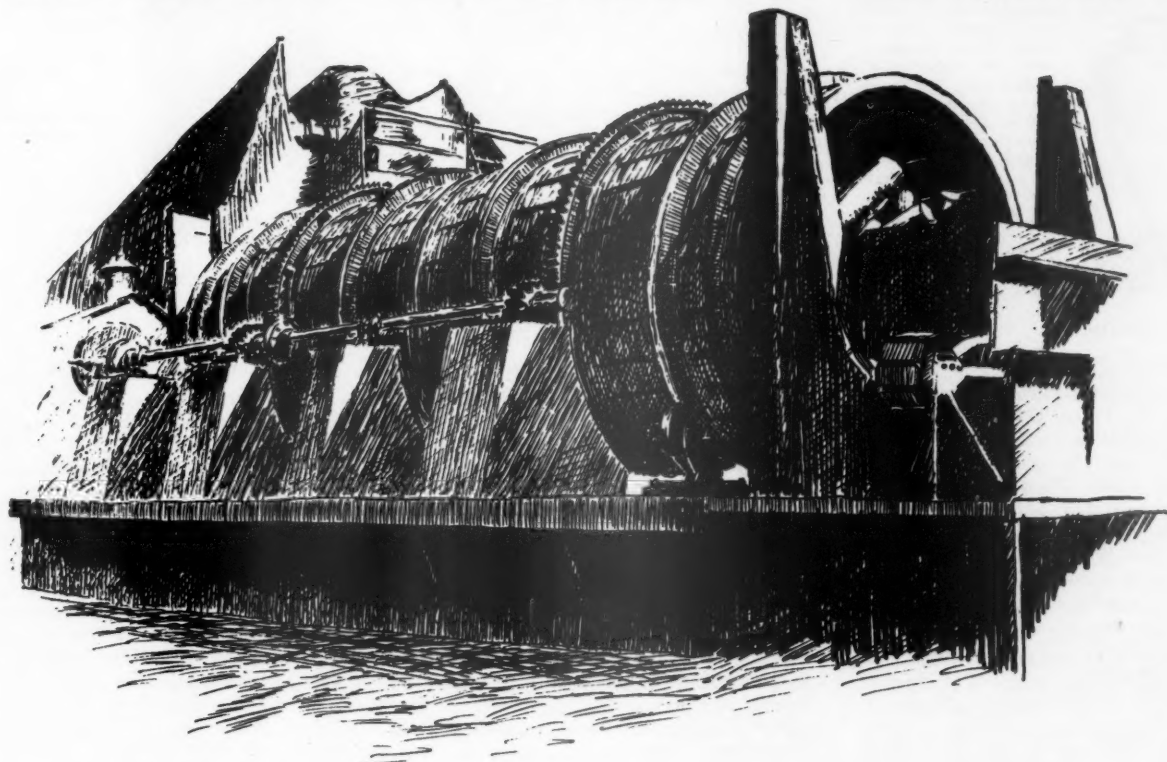
The spools of wire you see in the background are being wound onto the back beam of a loom. Every single wire from the 60 or more spools (depending on the size of the mesh) must be guided into an exact place of its own on the beam. Only a one-inch section of the beam can

be filled at a time. After this back beam is filled, each warp wire must be threaded through guides leading to the front of the loom, where the actual weaving takes place. This is one more of the many painstaking operations in the manufacture of quality fourdrinier wires.



EASTWOOD-NEALLEY CORPORATION • Belleville, N. J.

NEWPORT NEWS WELDED LOG BARKER



Sturdy Construction... *Rugged Performance*

The Newport News 45-foot welded log barker consists of two slotted drum sections with a total weight of 148,000 pounds. Each section is fabricated from three 1 1/4 inch steel plate rings welded together in halves. Heavy circumferential stiffener rings are welded on the outside of each section. The barker is equipped with cast steel gears and forged steel rails. After assembly and welding, each section is completely stress relieved.

The rugged performance record of the Newport News barker has proven the soundness of its sturdy one piece construction. Write for additional details.

NEWPORT NEWS

SHIPBUILDING AND DRYDOCK CO.

NEWPORT NEWS, VIRGINIA

Personals

SOUTH

K. O. ELDERKIN, manager of Crossett Paper Mills, Crossett, Ark., recently received his ten years' service award there.



E. A. FREEMAN, named Area Forester for Southern Pulpwood Conservation Ass'n, headquarters, 106 Calvin Ave., Ruston, La. Will serve Texas, Louisiana and Arkansas. He is fourth Area Forester for association, according to Henry J. Malsberger, Gen. Mgr. Others: Dawson M. Jennings, Montgomery, Ala.; Howard J. Doyle, Macon, Ga.; Francis J. Cook, Albemarle, N. C.

Personnel Shifts In Southern Plant

Jack W. Warner, third generation of the Gulf States Paper Corp., Tuscaloosa, Ala., has become sales manager of the E-Z Opener Bag Co., sales division, in a shift that made Fred M. Dickinson division vice-president and general manager; and Harvey C. Mapin, assistant sales manager. Jack Warner came back from the war to enter the mill and transfers to sales from post of production manager.

CHARLES H. CHAPMAN, who for two years has served as technical service engineer out of Atlanta office of Hercules Powder Co. (Papermakers Chemical Dept.), was transferred to Portland, Ore., office. This is the first assignment of this type. His place at Atlanta was filled by transfer of John E. Keough from Wilmington, Del. The change was effective Sept. 1.

CHARLES McCARTHY, paper mill superintendent for Southern Paperboard Corp., Port Wentworth, Ga., suffered a light heart attack while attending a baseball game early in September. After brief hospitalization he started to recuperate at home and expects to be back on the job.

H. A. BLUM is now calling on pulp and paper mills in parts of Florida and Georgia for General Chemical Div., Allied Chemical and Dye Corp., with Atlanta as headquarters. A long-time traveller for Hercules Powder prior to the segregation of lines about two years ago, Mr. Blum has many friends in southern industry.

Hudson Pulp Man Killed in Accident

J. J. (Joe) D'Arcey, master mechanic for Hudson Pulp & Paper Co. at Palatka, Fla., was killed in an automobile accident during the last week of August. An automobile in which D'Arcey and six other men (all killed) were returning from a baseball game at a nearby Florida point failed to make a curve and crashed into an obstacle. D'Arcey was one of the "old timers" of the Southern industry, having been with the old Braithewaite, La., mill when recovery boiler was first operated successfully there. The operation then was E-Z Opener Bag Co., now identified on the production side as Gulf States Paper Corp.

BROOKS TOLER, widely known forester who had been serving as public relations and pulpwood procurement director for Masonite Corp., Laurel, Miss., succumbed to a sudden heart attack while visiting his parents at Crowley, La., over the Labor Day week-end. He was a graduate of L. S. U. school of forestry.

CAMP GORDON JOHNSTON, near Carabelle, Fla., was examined by Coosa River Newsprint Co. (Coosa Pines, Ala.) in 1946 and during the past recent months was re-checked. Contrary to any implied reports, the Coosa River Newsprint Co. nor the Kimberly-Clark Corp. are interested in building a mill there.

R. F. (Dick) MULLER, manager of New Orleans office of Allis Chalmers Mfg Co., has become a grandfather. Yep! A Grandson. This happened at the end of August.

E. PUTNAM HEAD, district manager at Atlanta for Mason-Neilan Regulator Co. since January 1, 1948, underwent an operation in the hospital there on September 8.

BEN T. KIRBY, who served the southern pulp and paper industry for several years as field engineer for Goulds Pumps, Inc., has settled down in Miami, Fla., with C. P. Leveritt Electric Pump Sales Co., distributor for Goulds.

M. L. DION has been transferred from Chicago to Dallas, Texas, where he will represent Bristol Co. (Instruments). This is a new location for Bristol. It will be under the Houston, Texas, district office.

ARTHUR CHERRY has been appointed sales representative for the Memphis, Tenn., area of Union Bag & Paper Corp., Leonard J. Doyle, vice president in charge of sales, announces. Mr. Cherry had over 20 years' experience with Albermarle Paper Manufacturing Co. in Virginia, in both manufacturing and selling.

Rice Heads Southwest Office for Esco

Electric Steel Foundry Co., Portland, Ore., a nationally known firm specializing in production and distribution of stainless, manganese and high-alloy steels, completed its first year with a Southwest division sales office and warehouse in Houston, Tex., Sept. 3.



The firm leased a warehouse at 1920 Lorraine, to serve customers in Texas, Oklahoma, Arkansas, Louisiana and Mississippi. **W. R. Rice** (left) who came from the firm's San Francisco office to head the Southwest division, said ESCO

became interested in Houston as a result of information furnished by the industrial departments of the Houston Chamber of Commerce and the South Texas Commercial National Bank.

ESCO branches are in New York, Chicago, Los Angeles, San Francisco, Spokane, Eugene, Ore., Seattle and Honolulu. A subsidiary company operates in Vancouver, B.C. An Eastern plant producing powershovel dippers and buckets is at Danville, Ill.

The company has four major divisions: The Contractors Equipment Division handles ESCO powershovel dippers, dragline buckets, scraper blades, etc. The Logging and Sawmill Division is concerned with logging specialties. The Stainless Steel Division handles stainless steel pipe fittings, valves, chains, etc. The Process Equipment Division handles engineering, manufacture and sale of stainless specialty equipment.

Henderson and Sons Add New Line

W. W. (Bill) Henderson & Sons, Pensacola, Fla., have added another line to firms they represent among the southern pulp and paper mills, this being **E. C. Wolfrez Alloy Equipment**, of Belleville, N. J. Bill modestly says this is "one of the finest accounts in the country on stainless steel fabrication of all of the higher metals like monel, nickel, inconel, aluminum, evidur, silver, sprayed metal products." In addition to pipe and fittings this company manufactures process kettles, vats, troughs, tanks, heat transfer apparatus, mixers, brewing kettles, etc.

ROBERT AND COMPANY ASSOCIATES

96 POPLAR STREET

ATLANTA, GEORGIA

Consulting and Design Engineers to the
PAPER AND CHEMICAL INDUSTRIES

HAROLD R. MURDOCK, Chemical Engineer

PROCESS STUDIES • DESIGN • POWER PLANTS • INDUSTRIAL WASTE DISPOSAL

POWELL RIVER

UNBLEACHED SULPHITE PULP



- ★ STRENGTH
- ★ COLOR
- ★ SERVICE
- ★ DEPENDABLE
SUPPLY

**POWELL RIVER
SALES COMPANY
LIMITED**

1204 STANDARD BUILDING - VANCOUVER, B. C.

McCULLOCH *Presents the* **SAWING SENSATION**

a 25-pound one-man wonder

Every outstanding feature of the larger McCulloch Chain Saws is in the new, truly one-man, Model 3-25. Besides, all the experience gained in building the others has been carefully embodied in this great new chain saw achievement. The Model 3-25 answers the long standing demand for the *lightest* possible unit combined with dependability and high performance.

Check the features — see the Model 3-25 now on display — give it every test in the book, and you'll agree that it's your winning number.



Manufactured by

**McCULLOCH MOTORS
CORPORATION**

6101 West Century Boulevard
Los Angeles 45, California

The McCULLOCH Model 5-49 Bow Saw

... cuts up to 20-inch logs without pinching or prying in any position—flat on the ground, propped up, or swinging. Weight of this high production, 5 hp unit, is only 63 pounds.



of the year

- ★ 3 hp McCulloch die-cast gasoline engine
- ★ Less than 25 lbs. complete with 18" blade and chain
- ★ Pistol grip handle, trigger type throttle
- ★ All engine controls grouped for one-hand operation
- ★ Automatic Clutch stops chain when engine idles
- ★ Kickproof automatic rewind starter

- ★ Ignition points accessible for easy adjustment
- ★ Built-in chain oiler
- ★ Floatless carburetor permits sawing in any position



THERE'S A McCULLOCH CHAIN SAW FOR EVERY WOOD-CUTTING PURPOSE MODEL 3-25

18-inch blade \$295.00 24-inch blade \$305.00 14 -inch bow \$315.00

MODEL 5-49

20-inch blade \$385.00	50-inch blade \$415.00
30-inch blade \$395.00	60-inch blade \$425.00
40-inch blade \$405.00	20-inch bow \$425.00

All prices f. o. b. Los Angeles

SEND COUPON FOR
NEW DATA SHEET AND
COMPLETE SPECIFICATIONS

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Please send me immediately information on the NEW
Model 3-25 McCulloch chain saw.

NAME _____
ADDRESS _____
CITY _____ STATE _____



Pulp mills of the United States and Canada in North America consume more than 30 million cords of wood each year. Perpetuating this supply is the responsibility and the prime concern of management men of the pulp and paper industry. This represents a vast investment in machinery, labor and wood. This section of PULP & PAPER is devoted to ways and means of developing more efficient methods of forest management and wood production.

PROTECTION WITH CHEMICALS

How It Is Done at Gaylord Container Corp.



Detrimental effects of sap stain and mold in Southern pine pulpwood are held in abeyance for a definite storage period if the material has been sprayed with a control chemical, according to the experience of Gaylord Container Corp., Bogalusa, La. For the past nine years this company has been spraying the ends of pulpwood arriving at the mill yard in those cases in which the wood will be sent to the reserve stock.

This treatment is of interest in other regions of the continent, too, where use of sapwood is increasing.

Approximately 90 percent of the company's pulpwood arrives at the mill on end-rack railroad cars. The balance comes in on trucks. The common division is for the unloading of rail cars direct to the barker's feeding conveyor. The truck loads, which require more handling anyway, go to maintain the reserve yard stock. Railroad transported pulpwood, when stacked in the yard, is turned over every three months.

When a truck arrives with pulpwood, however, it is weighed on the woodyard's big Fairbanks-Morse scale. Then it pulls up a short space and the ends of the pulpwood are sprayed with a Dowicide "S" mixture. As a result of the spraying, pulpwood arriving by truck in the late spring and summer can be held in storage for four months, as against the three months for the untreated material. In the fall and winter months, the sprayed stock can be held five or six months, as

TOP VIEW: GAYLORD CONTAINER'S pulpwood arriving on rack cars, which are shown being spotted by new General Electric diesel-electric locomotive. The cars will be unloaded directly to the conveyor to barking drums.

Middle: Pulpwood arriving by truck is weighed in. Here's loaded Chevrolet on a Fairbank-Morse scale. As a general rule, trucked wood goes to the woodyard "reserve." On this truck is load of hardwood. **Below:** After weighing-in, the pulpwood on truck has both its ends sprayed with mixture of Dowicide. This is a load of pine pulpwood. In all parts of North America where more sapwood is coming into use in mills, this quick spraying operation will be of interest.

cut your pulpwood inventory with *Year Round* operation



The Carco E Winch will double your tractor's pulling power. For tractors from 30 to 45 HP

CARCO

CARCO Winch-Log Cart teams reduce stockpiling of pulpwood by working through mud and snow.

Big, expensive pulpwood stockpiles are unnecessary, because logging the year round with tractor winch and log cart assures a continuous supply of pulpwood. Carco Winch-Log Cart teams can stay on the job in soft ground or snow, bringing in the pulpwood.

The Carco Winch gives your tractor more pull and the Carco Log Cart lifts your load, reducing drag. More pull and less drag mean easier going at all times. When traction is poor due to soft ground, drop the load, go ahead to firm ground paying out the line. Then winch up load and proceed. This permits profitable logging even in sloppy weather.

You'll use fewer tractors too, because the Winch-Log Cart team easily doubles log output per tractor over drawbar methods.

There is a Carco Winch for nearly every tractor made and a Log Cart or Arch for every logging job. Put them to work for year round operation.

Get the most
out of your
Tractor Logging
Equipment with

CARCO

Rigging
Fittings

PACIFIC CAR AND FOUNDRY COMPANY

RENTON, WASHINGTON U.S.A.
BRANCHES: PORTLAND, OREGON - FRANKLIN PARK, ILLINOIS

against four months for the unsprayed. This applies to wood of comparable quality.

The spraying operation is simple. The actual spraying tool is a piece of small diameter pipe about five feet long branching into three half-inch spray nozzles. An air hose about 35 feet long will afford sufficient length to connect with the spray cylinder and to permit the operator to catch both sides of the truck without moving the vehicle. The mixture of one part Dowicide to five parts water (50 pounds to 250 gallons) is made in a drum set up on a platform five or six feet up. This drains into a second drum and from then to a storage drum inside the shelter house. A small automatic air pump—about 2 HP—moves the mixture to a cylinder laid horizontally on the ground, from which it is expelled through the spray hose. The 50 pounds of Dowicide takes care of approximately 100 trucks daily for a two weeks period.

The normal stock in Gaylord's wood yard may run about 26,000 cords, or sometimes up to 35,000 cords.

The Dowicide spray mixture is irritating but the hose length and spray pipe arrangements makes it possible for the operator to do his work without getting wet with it.

The depletion of virgin stands and resultant increased utilization of sapwood in the South, and perhaps later in the Pacific Northwest, tends to increase the economic significance of sap stain and molds. The sap stain may come to some slight degree from chemical results of weathering (seasoning) but more likely from fungus origin. The sap stain and mold may be handled in the same treatment.



— MEETINGS —

Society of American Foresters (Annual Meeting) — Olympic Hotel, Seattle, Wash.Oct. 10-14

Pacific Logging Congress Machinery Show—Civic Auditorium, Seattle, Wash.Nov. 14-16

Western Forestry & Conservation Assn. — Multnomah Hotel, Portland, Ore.Dec. 7-10

Hopkins To Represent Caterpillar in Spokane

The Western Sales Division of Caterpillar Tractor Co., San Leandro, Calif., B. L. Hagglund, western division sales manager, announces appointment of Thomas A. Hopkins as special representative in Sales Engineering, who will live at Spokane. Hopkins will work with "Caterpillar" distributors and customers on Diesel engine applications, earthmoving and logging problems. He is a graduate in electrical engineering, University of Utah.

CHARLES R. FRENCH, long identified with public relations in the pulp and paper field and notably with the American Forest Product Industries, Inc., died recently at his home in Bethesda, Md., from a heart attack. He was 46.

Less Than 100,000,000 Forest Acres Without Protection

For the first time in our history less than 100 million acres of forest land are without organized forest fire protection.

This was revealed in a recent survey released by the American Forest Products Industries, a non-profit organization supported by pulp and paper, lumber and plywood industries in the U.S. AFPI's aim is to encourage the best protection, management, and utilization of our forests.

The survey, based on latest U.S. Forest Service figures for the Nation, is an eight-page leaflet showing comparative effectiveness of forest protection in all timbered states.

The growth of the Keep Green program has kept pace with the increase of acreage under protection and the reduction of area burned on protected land.

In 1944 only three states—Washington, Oregon and Minnesota—were in the Keep Green program as compared with 24 states at the end of 1948. In 1944 there were 511,015,000 acres under organized protection and 554,683,000 for 1948—a gain of 43,668,000 acres.

Acreage burned on protected land was 2,673,017 for 1944 compared with 2,273,815 for 1948—a decrease of 399,202 acres.

Logs in Willamette

Tonnage moved through Willamette Falls locks in Willamette river at West Linn, Ore., during August totaled 191,000 tons (51 million board feet) downstream and 17,000 tons (4.5 million feet) upstream.

REGULATION IS "REPUGNANT"

Tinker Also Calls It Impractical



E. W. TINKER, Executive Secretary, APPA, also spoke at Portland, Ore., meeting of YAPPI, deploring government's lack of knowledge of the industry.

Two highly controversial Truman administration proposals—the Secretary of Agriculture's farm bill and the proposal for a Columbia River Valley Authority—contain provisions which would provide a rigid federal bureaucratic control over the growing and marketing of trees on private property, including many thousands of small farms. On these farms or small wood's operations are 75% of the private forests in the United States.

E. W. Tinker, executive secretary of the American Pulp & Paper Association, New York, definitely had in mind the new radical moves made by the Truman administration agencies and department in this direction, when he made a significant address on the subject recently at the University of Michigan in Ann Arbor, Mich.

In a lecture delivered at the Michigan Summer School session, he declared that public ownership and public control of natural resources, including the forests, is "repugnant to our general conception of the dignity of the individual."

He also said that as applied to forest lands, such control is "impractical" "not justified in any degree."

In the lead editorials in the August and June issues of **PULP & PAPER**, this magazine pointed out that threat to forest land owners contained in the Agriculture department's plan and the CVA proposal. Even though the former received a temporary setback in Congress this past

month, these are long term plans of the control advocates which no one ever expected would die with the 81st Congress.

In his lecture, Mr. Tinker cited a 1948 report of the U. S. Forest Service which classified 68% of cutting on large timber tracts, mostly industry-owned, as "good" or "high order."

The real problem is on the 75% of forest lands owned by 4,000,000 small owners with average holdings of only 62 acres.

The association executive said that despite "dramatic" pleas for federal regulation by persons "with their own individual or collective interests to promote, it is inconceivable that regulatory control will be applied to these owners. The mere policing of four million owners would be a terrific undertaking."

"Federal function in the field of natural resources should be limited to fundamental research on problems having interstate application, and to problems that must be solved for effective administration of federal properties," he declared.

NEW-

A "CATERPILLAR"
POWER PACKAGE
SMALL IN SIZE—
LOW IN COST—
BIG IN PRODUCTION

HERE's a complete earthmoving power package made to order for the logging industry. It's the reliable "Caterpillar" 43 drawbar horsepower D4 Tractor teamed up with the No. 4A Bulldozer and the new "Caterpillar" No. 40 Scraper. The unit shown here building a haul road loads $3\frac{1}{2}$ cubic yards in 45 seconds — averages 39 pay yards an hour on a 600-foot haul! This unit is hard to beat on truck road and millpond construction, 'dozing and skidding logs. Here are some of its advantages:

- 1 Low owning and operating cost, coupled with high production ability. A small package with big performance.
- 2 All hydraulic. 'Dozer or scraper can be put in use by a handy changeover valve next to operator.
- 3 An all-"Caterpillar" team—one manufacturer and one dealer.
- 4 'Dozer-type ejection on scraper pushes load forward and under blade, for smooth spreading.
- 5 Rear wheels ride inside the cut, allow work close to trees or banks.
- 6 'Dozer blade can be angled or tilted to suit all conditions.

Mail the coupon today and find out more about this money-making power package.

Caterpillar Tractor Co. • San Leandro, Calif.; Peoria, Ill.



Price of a standard D4 Tractor is \$4425; No. 4A Bulldozer is \$1380; No. 40 Scraper is \$2975; No. 44 hydraulic control for use with No. 40 Scraper and No. 4A Bulldozer is \$535, f.o.b. Peoria, Illinois, subject to change without notice.

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EARTHMOVING EQUIPMENT

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Please send me full information on the D4 'Dozer-Scraper combination.

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Personals

PACIFIC COAST

JACK MORRIS, office manager of Fibreboard Products Inc., Port Angeles, on leave because of illness, recently celebrated his birthday in Tacoma, Wash., where he is doctoring, and the Port Angeles office sent him a potted plant. **KEITH APLING**, accountant, visited Jack in Tacoma.

A BROWN-EYED BABY GIRL—STEPHANIE, is the newest member of the Pete Onkels household in Bellingham. The little miss arrived on August 8, welcomed by three brothers, a sister and the proud parents. Her father is manager of the Pacific Coast Paper Mills, Bellingham, Wash.

Adds New Facilities

Over a quarter of a million dollars has been spent on modernization and new equipment by Griffith Rubber Mills of Portland, Ore., to improve facilities for manufacture of roll covering for the paper industry, according to Z. A. Wise (right) vice president and general manager.



In addition to purchase of a new building, Griffith Mills have purchased several vulcanizer tubes, one the largest on the Pacific Coast.

A multiple drill, one of three such machines in the U. S., seven hydraulic presses, a Banberry and 60" mill and extruding machine have been added.

Named West Coast Manager

Walter J. Maytham, Jr., (right), formerly of Chicago, has been appointed Pacific Coast district manager for Westinghouse Electric Corp. effective immediately, according to T. Fort, manager of apparatus sales for Westinghouse.



Mr. Maytham takes over the duties formerly carried by Chas. A. Dostel, vice president, who retires next May.

Mr. Maytham will make his headquarters in San Francisco. For the past five years he has been manager of industrial sales in the Northwestern district, with headquarters in Chicago. Born in Atlanta, Ga., he graduated in 1925 from Iowa State College with B. S. in electrical engineering. Joining Westinghouse in 1926, he served as industrial salesman in Indianapolis until 1929 when he transferred to Chicago.

C. H. "SCRAM" GRAHAM has moved from Seattle offices of Bumstead-Woolford Co., 1411 4th Ave., to the Portland, Ore., Lewis Bldg. office, where he previously had been located many years, and **E. E. "STEVE" STEPHENS** transferred from Portland back to Seattle, where he, likewise, had a previous long tenure. They had exchanged positions for more than seven months in order that each might become experienced in the activities throughout the Northwest, where Bumstead-Woolford represents Foxboro Co.

WHEN FRANCIS (Bill) HERB, president of Pacific Coast Paper Mills, Bellingham, decided to paint his house he got more than he bargained for. One of the painters had the misfortune to set the house on fire while removing paint with a torch. Considerable damage resulted. Repairmen are now busy giving the dwelling a "new look".

LESLIE MULLINS, board mill supt.; **HARRY LIVEZEY**, mill finishing; **GERTRUDE CASSIDY**, billing dept.; **HOWARD SHERWOOD**, shipping, and **AINSLY BOSTON**, board mill, were 30-year pin winners recently at a celebration dinner of the Stockton, Calif., division of Fibreboard Products Inc.

Three Pusey & Jones Men On Pacific Coast

R. S. Johnston, vice president; **Frank M. Sanger**, chief engineer, and **P. A. Jackson**, sales engineer, comprised a trio of top Pusey & Jones Corp. executives who visited the Pacific Coast in September. This company recently had completed a new high speed paper machine at Tacoma for St. Regis and another project since the war was revamping a machine for West Tacoma Newsprint Co.

\$500,000

BEHIND A ROLL COVERING JOB



Weyerhaeuser Timber Company, Pulp Division, Everett, Washington

GRIFFITH RUBBER COVERED ROLLS LAST LONGER

Paper rolls at the Weyerhaeuser Timber Company at Everett, Washington, are covered by quality rubber that lasts longer. A half a million dollars worth of equipment was employed in covering these rolls. Griffith Rubber Mills, the most completely equipped plant of its kind in the Northwest, handles all types of rubber-covered rolls.

Equipment plus experience since 1911 assures you of the highest quality rubber-covered rolls. Quality rolls help to make quality paper. For your next roll covering job call Griffith.

GRIFFITH RUBBER MILLS

"Quality Rubber Products Since 1911"

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PAPER

PORTLAND CONVENTION

(Continued from page 40)

local sections and the improvement of technical papers to "attain the standards of a professional society." Remarking that this was the 20th anniversary of the oldest section, the Pacific Coast section, he said this group had achieved much on both these counts.

The next speaker, William R. Barber, who has just retired at his own request as technical director of the Central Technical and Research Dept., Crown Zellerbach Corp., and has moved to Oakland to carry on special work for Crown in the waxed paper field, was introduced with these words by Chairman Walter Holzer:

"No one has done more to develop excellent programs in our Coast section and no one has done more to make the Shibley Award contests successful and to encourage participation by the best qualified young men in all our Coast mills."

Mr. Barber's comments introductory to the Shibley award are reported in the article on the Sulfitte Pulping Session in this issue, written for us by Dr. Booth, in which he also reviews the winning paper by Vance Reynolds, of Puget Sound Pulp & Timber Co. Other 1949 contestants were J. A. Dykstra, Publishers Paper Co.; Everett Reichman, Fibreboard Div., Simpson Logging Co., and Robert S. Towne, Fibreboard Board Products, Port Angeles. In awarding the top prize to Mr. Reynolds and book awards to them all, Mr. Bachman said:

"I hope other sections will emulate your Shibley contest."

Murdock Discusses Japan

Mr. Turcotte then made his address and he was followed by Dr. Harold R. Murdock, who only recently won a "Commendation for Meritorious Civilian Service" from the U. S. Army for "outstanding performance of duty" during his three years' service as head of the pulp and paper industry in Japan for General MacArthur. Dr. Murdock is presently with Robert & Co. Associates, engineering firm of Atlanta, Ga.

His was a scintillating address on the Japanese industry and its problems and how they are being met, much of which has previously been published in this magazine in direct reports received from Dr. Murdock.

He outlined five objectives which he adopted in 1946:

1. Better use of pulpwood; 2. Better forest management and reforestation; 3. Dissolution of the dominant Oji Co., which made 85% of Jap paper before the war; 4. Sponsorship of a technical association; 5. Increased production.

He outlined how all of these objectives now have been achieved to a greater or lesser degree. He started five mills on semi-chemical pulp production, which takes advantage of high yield processes he introduced and which **PULP & PAPER** has previously reported. The Oji Co. has been broken down into three companies and competition has made gains. Paper production is now twice what it was in

1945, when it had fallen off to 291,000 tons from 1,703,000 tons in 1940.

Japan is at least 15 years behind the paper technology of the rest of the world, he said, but he formed a Japanese TAPPI, now having over 1250 individual members, and he praised the scientific spirit they are showing.

Given wood, chemicals and coal, Japan could meet its paper needs, he said, but he predicted in closing that it will be making straw paper in a few years — and its 18 million tons a year of residual straw could more than produce all the paper it requires.

Second General Session

The important addresses by Mr. Tinker and Mr. Strange in the second and final general session have been reported.

At this session, E. A. Tippetts, of Rayon division of DuPont Co., warned the high alpha pulp industry that it will have to be on its toes to stay in competition with the synthetic polymer manufacturers.

"The rayon industry will make the best possible products, but the responsibility for improvements lies with your pulp mills," he said. "The mills in this field must consider themselves as polymer manufacturers in competition with synthetic polymer manufacturers. The chief virtue of wood cellulose as a polymer has been its relatively low cost. But as the synthetic polymer development increases this advantage narrows, as nylon has already demonstrated."

Pointing to one field for research, he

said: "We do not know much about the pentosan effects upon fibers."

He predicted that the rayon and cellophane industries of the U. S., which used about 550,000 tons of wood pulp in 1948, would be requiring up to 800,000 tons annually in 1951 and 1952. But the biggest increases in wood pulp demand would be for (1) rayon for tire cord (which now requires half the wood pulp for rayon use) and (2) moisture-proof cellophane. He predicted the demand for wood pulp would decrease or remain static for textiles, plastics and other miscellaneous uses, including some of which have never been important.

Dr. Emil F. F. Heuser, "Mr. Cellulose" of this industry and long an outstanding figure at the Institute in Appleton, who now lives in retirement at LaJolla, Calif., gave the remaining paper at this final session, which has been briefed by him for **PULP & PAPER**. His summary is published on page 62.

ED TIDLAND, Pacific Coast Supply Co., Portland, Ore., was a visitor in Brooklyn for a week in August. He was attending the national sales conference of the Cameron Machine Co. He did such a good job of "selling" the September meeting in Portland that "BUD" LATHROP, new president of Cameron, decided to accompany JOE SCHEUERMANN, Cameron sales manager, and Mrs. Scheuermann on the special train west. Mr. Lathrop is no stranger to the west coast, as he was stationed in the Yukon with Army Air Force during the last war.



STEBBINS Semtile tanks are constructed of cored Semtile with steel reinforcement, both vertically and horizontally. The cores are solidly filled with concrete so that the resulting structure is a reinforced concrete wall, faced on both sides with a corrosion resistant vitrified glazed tile. There are no through joints in a Semtile tank, either horizontally or vertically.

The Semtile salt-glazed cored tile presents a smooth, easy to clean surface which is impervious to the corrosive action of stock slurries.

At the price of materials today, a Semtile tank costs no more than a concrete, lined steel, wood or ordinary tile tank.

They pay dividends year after year through dependable service.



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TEXTILE TOWER SEATTLE 1, WASHINGTON

Personals

CANADA



PETER MCGHEE, Plant Manager, B. C. Pulp & Paper Co., Port Alice, B. C., holds Distinguished Service to Safety Award of National Safety Council.

HAMILTON S. CRAIG, formerly general manager of LongLac Pulp & Paper Co., Terrace Bay, Ont., has been appointed director of service operations for Kimberly-Clark of Canada, with offices in Toronto.

HENRY J. OSTROWSKI, former technical director, Pacific Mills Ltd., Ocean Falls, is now owner and manager of Credit Valley Lime Co., Box 400, Georgetown, Ontario.

K. W. MATHESON has been appointed assistant to the general manager of The Fraser Companies with headquarters at Edmundston, N. B., mill.

JOHN LANGLEY, Donnacana Paper Co., is the new chairman of the Quebec District Pulp and Paper Association. **J. G. McDONALD** of Portneuf is vice-chairman, and **J. B. PAPOE**, of Beupre, of Abitibi Power & Paper Co., secretary-treasurer.



ROBLEY A. BUTLER, recently appointed Technical Control Supervisor, Ocean Falls Div. of Pacific Mills, Ltd. He had been with Crown Zellerbach Corp.

M. R. KANE, vice-president in charge of operations for Price Brothers & Co., Quebec City, has retired after more than half a century's service with the company. He has been succeeded by **R. F. ARMITAGE**, who has been with Price Brothers 30 years, latterly as division manager at Chicoutimi.

L. B. SHAFFREY worked for Bowater's Newfoundland Pulp & Paper Mills until he reached the retirement age of 65, but he's still active supervising the unloading of pulpwood at Corner Brook for Marine Industries, Ltd., Montreal. He was Bowater's superintendent of wood preparation and mill yard operations for 17 years.

HARRY ANDREWS, executive assistant to the president, Powell River Co., Vancouver, B. C., flew to Australia late in August to visit the newsprint mills of Tasmania and "return the call" of several Australian pulp and paper executives to Canada in recent months.

DR. R. A. RAFF, formerly of Howard Smith Paper Mills' research department at Cornwall, Ont., joined the staff of Koppers Co., Inc., at Pittsburgh, and it required an act of Congress to admit him. An Austrian by birth, Dr. Raff became a Canadian citizen in 1939.

DENNIS H. O'BRIEN, after eight years as board mill superintendent for E. B. Eddy Co. at Hull, Que., has resigned to take charge of Anglo-Canadian Pulp and Paper Mills' new paperboard operation.

J. B. ELDREDGE has gone to Dolbeau, Que., to join St. John Power & Paper Co., replacing as electrical superintendent H. Christensen, who has returned to his home in Denmark.

Calls on Coastal Mills In 16-Ft. Open Boat

F. R. "Bill" Killam and Frank Bacon of Industrial Coatings, Ltd., Vancouver, B. C., recently visited mills at Ocean Falls and Port Alice in a 16-foot open boat. At some remote upcoast places, they were stared at by the inhabitants who couldn't believe anyone would tackle open water in such a small boat.

Harold Moorhead, resident engineer, and Ross Black, general mechanical superintendent, Powell River, accompanied the adventurous salesmen on a fishing foray to the Yuclataw Rapids—and Mr. Moorhead fell overboard.

Bill Killam is a son of Lawrence Killam, president of B. C. Pulp & Paper Co.



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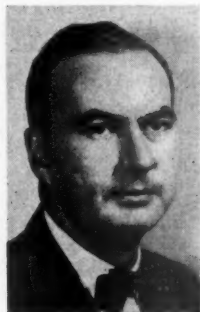
CANTON, MASSACHUSETTS

RALPH E. BRIGGS, Sales Manager

● BRADFORD WEST, Pittsfield, Mass. ● WILLIAM N. CONNOR, Jr., Canton, Mass. ● L. H. BREYFOGLE, Kalamazoo, Mich. ●
● WALTER A. SALMONSON, 2514 Northeast 59th Ave., Portland, Oregon ● L. L. GRIFFITHS, Jr., Kalamazoo, Mich. ●
● HAROLD H. FISH, Syracuse, N. Y. ●

Personals

MIDDLE WEST



AL L. SHERWOOD (left), Vice President and Director of Engineering and Technical Department for Sutherland Paper Co., had a prominent role in directing the planning and engineering for new modern 2-story paper mill and new converting plant built by his firm at Kalamazoo, Mich. Last month we reported the start-up of new No. 4 Black-Clawson machine in this mill. The work was jointly headed up by Mr. Sherwood and Supt. Glen Sutton.

ROBYN CAMPBELL (right), appointed Assistant Director of Research, in Charge of Pulp & Paper, for Minnesota & Ontario Paper Co., Minneapolis, with new Research Laboratory at International Falls, Minn. M & O research is headed up by M. C. Wunderlich, who was long been distinguished in insulating board field, which is separate from the pulp and paper operations. Mr. Campbell was in sales and production for M & O after being Assistant Manager at Blandin Paper Co.

JOHN R. KIMBERLY of Kimberly-Clark Corp., Neenah, Wis., won the historic Sawyer cup of Lake Winnebago competition when he set a new record in Class A competition for the trophy in its 43-year history. He skipped his son's Gull II to the 12-mile course record of 1 hr., 11 min., 42 seconds. Carleton Smith, Mowbry Smith, Jr., Dick Boehm and Bob Haas were his crew. **W. R. KELLETT**, assistant vice president of Kimberly-Clark, sailing the Kimberly-Kellett "Last Chance" finished third, just 40 seconds behind the winner, with Russell Johnson, Don Raiche, Buzz Kellett and George Zeitelman as crew. An Oshkosh entry was second.

MRS. JOHN STRANGE, Neenah, Wis., former president of the John Strange Paper Co., was recently honored by her family with a dinner party on her 95th birthday.

NORM BOETTCHER, yard foreman at Thilmany Pulp & Paper Co., Kaukauna, Wis., is a candidate this year for the Quarter Century club. He was recently chosen "foreman of the month" by the mill's "Thilco News."

ORRIS SCHMIDT, head of ink room at Thilmany Pulp & Paper Co., Kaukauna, Wis., was recently elected for a biographical sketch in "Who's Who" section of the mill paper. "Orry" has been at Thilmany for 18 years.

JULIUS A. ZINN, former president of ZinPak Corp., has formed a new company known as Zinn Enterprises, Inc., at 520 No. Michigan Ave., Chicago, the "Zin-Package Maker" to develop, manufacture and distribute new machinery and containers and methods of manufacturing containers.

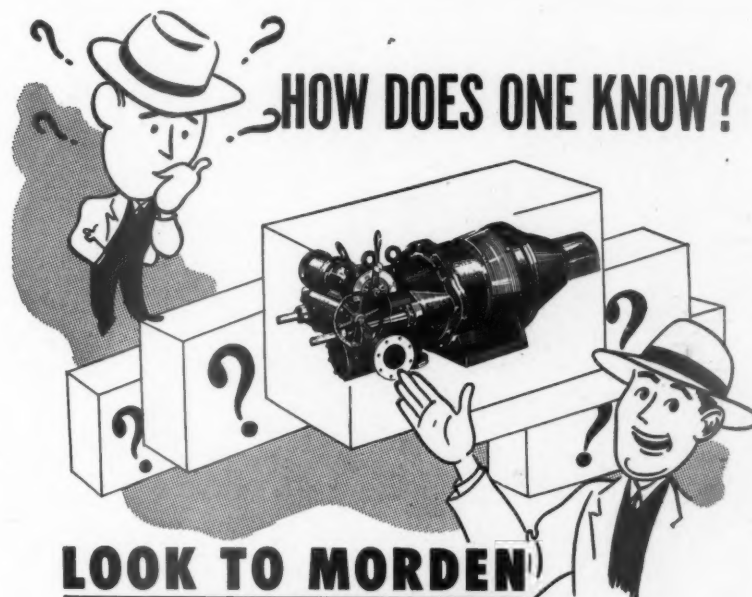
JOHN B. CATLIN, 128 North Commercial St., Neenah, Wis., with the Kimberly-Clark Corp., is a new member of the active Salesmen's Association of the Paper Industry.

W. H. SWANSON, chief of staff for pulp production for all Kimberly-Clark mills, with offices in Neenah, Wis., is very active in the Boy Scout movement and has been serving as the Boy Scouts of America chairman for the Fox River Valley Council.

HERMAN FREIER and **RICHARD GEURTZ** were selected recently by their fellow workers at Thilmany Pulp & Paper Co., Kaukauna, Wis., for biographical sketches in the mill's magazine. Herman has worked for Thilmany since 1912 in the digester room and yard. Dick Geurtz will enroll in the engineering school at the U. of Wisconsin this year after working two years at Kaukauna.

LAWRENCE SCHMITZ, one of Thilmany's few eligible bachelors and a member of the supercalender dept., was also selected by popular vote for the "Who's Who" section.

RUSSELL H. SAVAGE, formerly technical director, is now vice president in charge of research for all the Mead Corp. mills, with his headquarters at Chillicothe, O.



Are you looking for a machine that combines the best features of time proven beater and jordan treatment?

Are you looking for one versatile machine suitable for all beating and refining treatment whether it be a light brushing or the extremes of hydration?

Are you looking for continuous flow production to eliminate batching or cycling methods either to supplement or replace your present equipment?

We know you are looking for quality improvement or increased production along with savings in power, maintenance and space. Then look to Morden. Ask us to explain what "Stock-Makers" are doing in treatments that would be of particular interest to you.

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C-Z REORGANIZES RESEARCH

New Assignments for Several Key Officials

Important assignments in Crown Zellerbach's research management personnel were announced last month by A. B. Layton, vice president and chairman of Crown Zellerbach Corp.'s research and development committee.

Dr. William Moyer, director of research, will assume responsibility for the Central Research Department, Camas, Wash., formerly known as the Central Research and Technical Department. Mr. Moyer will also direct the activities of the Central Research Laboratory at Camas.

William R. Barber, who has devoted many years to the planning and development of Crown Zellerbach's Central

Research and Technical Department, is completing his duties as technical director of the Western Waxed Paper Co. Division of Crown Zellerbach, with headquarters at the San Leandro, Calif., laboratory. The San Leandro laboratory serves customer requirements of Western Waxed plants at North Portland, Ore., San Leandro, and Los Angeles.

Said Mr. Layton: "The present reorganization of the Central Research and Technical Department represents the completion of the program which Mr. Barber has long planned and advocated, including his own release from the position of director at this stage of the development. The technical activities of the

Western Waxed Paper Division of Crown Zellerbach are facing a period of development in which the experience and abilities of Mr. Barber are considered highly valuable."

Other reassignments of duties in the Central Research Department of the company are the promotion of W. F. Holzer and W. M. Hearon each to the position of assistant director of research. Dr. Holzer will be responsible for mill service and contacts in addition to directing the work of the Experimental Pulping, Forestry, Specifications, and Special Services Sections. Dr. Hearon will be responsible for and direct the work of the By-Products, Pulp, Paper, and Special Problems Research Sections and the Scientific Laboratory.

G. D. King is promoted to the position of manager of new products development with headquarters in the San Francisco sales office. Directly responsible to Dr. Moyer, Dr. King will give technical assistance to the sales department in the development of markets for new paper products and implement the development of new products for which there is a demand. In addition he will direct and correlate the work of the paper products development section in the Central Research Laboratory under the immediate supervision of J. S. Barton.



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- Light Weight ● Low Cost ● Corrosion-Resistant
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SOUTHERN REPRESENTATIVE

SOUTHERN CORPORATION, P.O. BOX 810, CHARLESTON, SOUTH CAROLINA



RILEY M. OWENS (left), appointed General Representative of Anheuser-Busch Corn Products Department with offices at 33rd and 12th Ave., New York, as announced by Arthur C. Mohr, Sales Mgr. of Division.

SAMUEL B. APPLEBAUM (right), new Manager of Cold Processes, Water Treating Division, Cochrane Corp., Philadelphia. He is also President of Liquid Conditioning Corp., a Cochrane subsidiary.

Chemical Linings Opens New Offices in Watertown

Murray H. Bennett, president of Chemical Linings, Inc., has announced the removal of his offices and headquarters from the Electric Building to 500 Trust Company Bldg., Watertown, N.Y. He also announces that offices will be opened shortly in Montreal.

Mr. Bennett recently completed a trip from Maine to Washington state in visiting mills and attending meetings.

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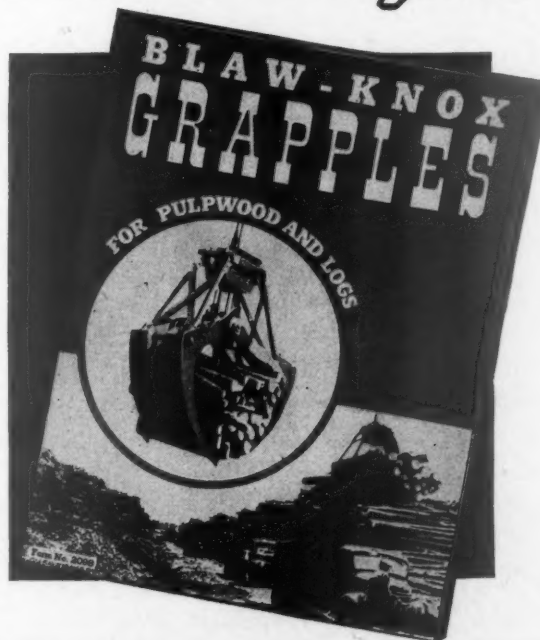


For fast unloading and handling of pulpwood, for symmetrical stacking or rehandling from corded piles—you'll find the size and type you need in this new Bulletin on—

BLAW-KNOX GRAPPLES

It is complete with photos, diagrams, specifications and performance data of interest to anyone concerned with pulpwood handling. Before you decide on your next purchase write for Bulletin No. 2098.

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in 16 months
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This is the latest record of EBASCO engineers on a complete paper machine installation. For a southwestern paper mill, they did the complete job through their teamwork of engineering and installation.

Look for this same profitable speed in your own plans for expansion, modernization and installation of a complete new mill.

EBASCO designs buildings and equipment, purchases all components, erects and installs everything. We deliver to you a paper machine in operation.

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C. Benson Branch New Dow Technical Manager

C. Benson Branch, plastics division, The Dow Chemical Co., has been named manager of the firm's Technical Service and Development Div., according to Donald Williams, director of sales. A native of Cleveland, Mr. Branch was graduated from Western Reserve University in chemistry. He studied chemistry for a year in Heidleburg, Germany. He joined Dow in 1937.

During war years Mr. Branch was a production superintendent of Dow's Texas styrene plant. He also had charge of benzene recovery from petroleum by-products and of the cracking of polypropyl benzene for aviation fuels. In 1946 he assumed charge of the coatings and raw materials section of the firm's plastics division. He is married and resides in Midland, Mich., with his wife and four daughters.

Marathon Earnings

Consolidated net earnings of Marathon Corp. and subsidiaries in nine months ended July 31, 1949, were \$3,390,857, compared with earnings of \$4,290,336 in the corresponding nine months of the preceding year. D. C. Everest, president, announces.

FOR SALE

Complete suction press section and two plain press sections — unused — 94" face bottom rolls. Reply Box P&P-52, Pulp & Paper, 71 Columbia St., Seattle 4, Wash.

PULPMILL CHEMIST

New West Coast Sulphate Mill has excellent opportunity for Chief Chemist to take charge of control laboratory, organize testing procedure and assist in expansion of laboratory facilities. Applicant should have five years' experience in Kraft mill control, pulp testing, etc., with supervisory ability. Reply, giving full particulars as to age, experience, technical qualifications, history and salary expected. All replies strictly confidential. Box P&P-51, Pulp & Paper, 71 Columbia St., Seattle 4, Wash.

For Sale:

Will Sacrifice:

1—9" x 12" American Ball Horizontal Twin Slow Speed Automatic Steam Engine with two 3" Pickering Governors, Speed Regulating Changer. Automatic Lubrication. 150 Horse Power.

1—96" Murray Chipper, roller bearing, complete with 150 HP, 200 RPM, direct connected synchronous motor, automatic full voltage, starting panel and MG set. Three sets knives.

All above equipment may be observed in operation and is in good operating condition.

Reply Box P&P-49, Pulp & Paper, 71 Columbia Street, Seattle 4, Wash.

Dorr Company Moving To Stamford, Conn.

The Dorr Company will move its main office, presently at 570 Lexington Ave., New York, to Stamford, Conn., in December of this year, in order to provide larger office space and better working conditions in an atmosphere less crowded than metropolitan New York, for its main office staff of about 225 persons. The new office will be located in the Northam Warren Building on Barry Place. A smaller office will be continued in New York City.

Bethlehem Steel to Have Northwest Fabricating Shop

Bethlehem Pacific Coast Steel Corp. has purchased about eight acres of land adjacent to Isaacson Iron Works' Plant No. 2, on East Marginal Way, Seattle, where they will immediately begin construction of a structural steel fabricating shop. It will be ready for operation about April 1. It is near the company's Seattle steel manufacturing plant.

Sprout-Waldron Issue 12-Page Equipment Bulletin

Bulletin 44 illustrates the broad line of machines which are available at Sprout-Waldron to meet the specialized processing needs of many different plants. Equipment classifications illustrated are size reduction, mixing and blending, bulk materials handling, product classification, and pelleting and special facilities. Bulletin 44 is available on request by writing Sprout-Waldron & Co., Inc., 112 Sherman St., Muncy, Pa.

PUGET SOUND PULP & TIMBER CO. declared a dividend of 25 cents a share on the common stock payable Sept. 30.

ASSISTANT SALES MANAGER

In view of pending promotion of Sales Manager to Assistant of President, position as Sales Manager in our company will soon be open. Mill capacity is 25,000 tons per year of tissue and other lightweight papers, both straight and machine creped. We look for a man with solid knowledge of sales of converted tissue specialties, age 35-40 or thereabout, and with genuine interest in sales and sales promotion work, to act as Assistant Sales Manager with speedy chance to be promoted to Sales Manager.

Please write with full particulars to Fernstrom Paper Mills, Inc., Pomona, California, attention of President, who will treat applications with discretion.

PULP & PAPER

Paper Men...

There's a double profit for you in corn



That's a fact

First off, products from corn are a big help in making better papers at lower cost. For instance, there's AMIJEL* for the beaters and GLOBE* Starch for the beaters and enzyme conversion... and CORAGUM* for corrugating and LAM-O-DEX* for laminating.

And then, corn is a big factor in that 25-billion-dollar farm market which buys mountains of all kinds of paper products.

Corn helps keep dollars rolling your way... dollars saved in production and dollars made in sales.

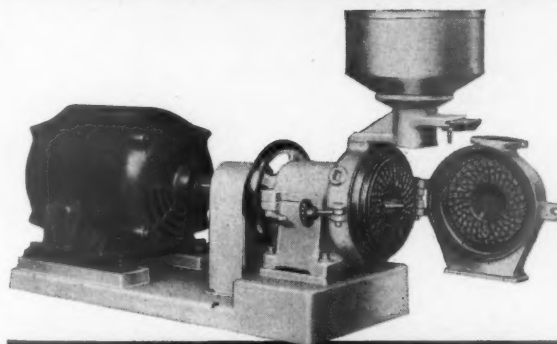
*Consult our Technical Sales Department—without obligation
—for information on the profitable use of these products.*

Corn Products Sales Company
17 Battery Place • New York 4, N. Y.

*GLOBE, AMIJEL, CORAGUM and LAM-O-DEX are registered trade-marks
of Corn Products Refining Company, New York, N. Y.

October, 1949

FOR EXPERIMENTAL PULPING



Bauer NO. 148-1E LABORATORY MILL

For the study of fiber treating possibilities, this new 8-inch disc mill has a place in every laboratory. Small batches can be pulped for investigating many kinds of materials. These tests are particularly useful in predicting the behavior of semi-chemical cooked pulps. One of the outstanding advantages of the Laboratory Mill is its usefulness in quickly plotting beating curves. The Laboratory Mill can be employed for dry or wet grinding. When used for the latter purpose, it is equipped with a shower for adding water.

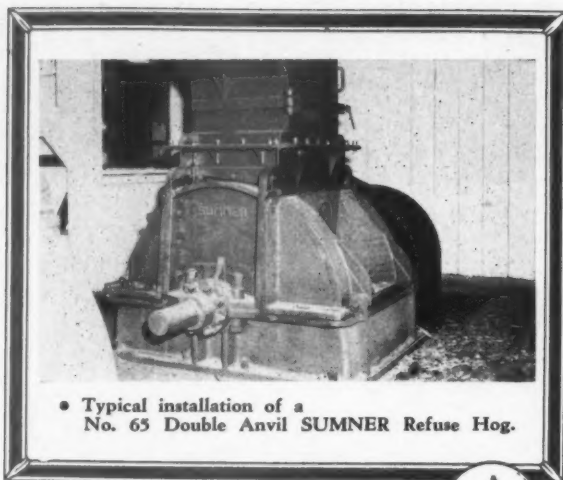
Since the head of the mill can be swung open for cleaning the interior, entire samples of test quantities can be recovered. The hinged door is also a convenience for changing plates, which are available in a variety of designs.

The mill is equipped with a 3- or 5-h.p. built-in motor or a sheave for V-belt drive. It will accept up to 20 h.p. input. The head is water cooled to dissipate frictional heat.

Numerous associations, societies, and institutions have approved and endorsed the Bauer Laboratory Mill for sample and test runs.

You are invited to request literature and data.

THE BAUER BROS. CO.
OF 1760 Sheridan Avenue
SPRINGFIELD 99, OHIO



• Typical installation of a
No. 65 Double Anvil SUMNER Refuse Hog.

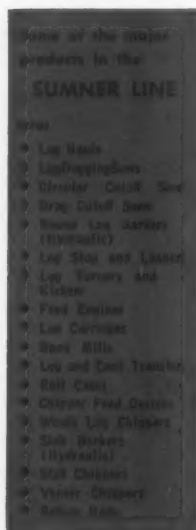
REFUSE HOG

by SUMNER



A 3-Way Winner!

- Simplicity and Sturdiness of Construction
- Known Reliability
- Prompt Availability of Parts



First favorite with Pacific Coast Pulp and Paper Mills, practically every one of which have installed SUMNER HOGS.

SINGLE OR DOUBLE ANVILS

No. 45 and No. 65 Hogs have single or double anvils, with interchangeable and reversible knives.

No. 35 Hogs are made with single anvils, interchangeable and reversible knives.

CONSTRUCTION

No. 45 and No. 65 Hogs are All-Steel type. No. 35 Hogs are available in either All-Steel type or Standard type with Cast Iron Frame, Center Sections and Rear Door.

ALL SUMNER HOGS can be furnished for direct motor drive, with or without steel sub-base, or for "V" or flat belt drives.

*RATED CAPACITIES

No. 35 Hog — 10 cords per hour

No. 45 Hog — 16 cords per hour

No. 65 Hog — 20 cords per hour

*The size Hog required is primarily determined by the size of the spout opening necessary to receive the maximum size refuse to be fed to the Hog.

Detailed information gladly furnished on request.

SUMNER

IRON WORKS

EVERETT, WASHINGTON

Since 1892

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More Lives THAN A CAT!

After a sheet of fine paper—book or bond—has served the purpose for which it was made, it finds its way back to some paper mill. There it is mixed with other "waste" and converted into coarse paper or board. This round trip may be repeated indefinitely.

It makes no difference whether your mill is the first converter of the original raw stock or the last—whether you operate Fourdrinier machines or cylinders—whether you manufacture fine papers, coarse papers or container board—Hamilton Felts will serve you well.

Because Hamilton Felts remove more water at the presses they require less heat and shorter time at the driers. Sheets are therefore tougher, with better finish and fewer ends. Production costs per ton are at rock bottom.

SHULER & BENNINGHOFFEN

HAMILTON, OHIO

Miami Woolen Mills, Established 1858

Hamilton Felts

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SULFITE SESSION

(Continued from page 44)

two years to determine the way in which the temperature alters in the linings during a cook. Mr. Quinn outlined the many factors, such as resistance to spalling, permeation, thermal conductivity, and changes in external conditions, which must be taken into account whenever a new lining is designed. Resin cements have proved to be one of the answers which allow a resistant lining to be prepared.

The results of this work were summed up by the speaker by saying that the information obtained allowed new linings to be designed which are probably superior to present calcium base linings in length of service, without being any more costly. As operating conditions in mills are standardized so that more closely controlled cycles can prevent thermal shocks, even denser and more vitrified brick can be used.

Sulfite Delignification

The final paper took the form of a discussion of several slides which illustrated "Certain Factors That Influence the Delignification in Acid Sulfite Pulping." This was presented in a very interesting manner by G. A. Richter, superintendent of Wood Cellulose Development, Eastman Kodak Co, Kodak Park, N. Y. He has done much work and published many papers on the chemistry of pulping. For the present work he selected western hemlock as an easily pulped wood which, under the deliberately exaggerated conditions used, would show the reactions of the lignin without any masking from other properties. The chips used were of uniform moisture content and size.

Several variations of two stage and three stage cooking processes were tested. In the first set the second stage consisted of cooking with 15% free sulfur dioxide solution, and in the second set, with an acid having 8% free and 1% combined sulfur dioxide. The first stage in both sets consisted of several different methods of pretreatment. Pretreatment at high temperatures with water, dilute caustic, or dilute sulfurous acid rendered the lignin almost wholly inert to later removal by sulfite or sulfurous acid. However, if the pretreatment consisted of cooking with sodium sulfite, thereby allowing sulfonation to take place," a second stage digestion that allows additional sulfonation or sulfurous acid hydrolysis or both will result in almost complete delignification. Effective pre-sulfonation can be followed with a high temperature aqueous treatment of a sort that will in itself ordinarily cause the lig-

nin to become unreactive, without appreciable interference in a third pulping with sulfite solutions."

It was difficult to grasp the full significance of these extensive results in the short time allotted to Dr. Richter to give his talk.

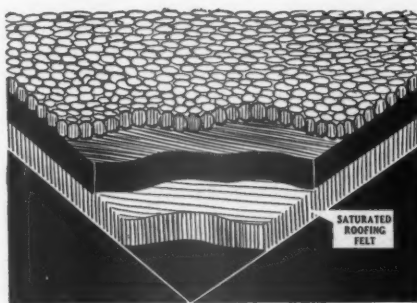
Powell River Sales Service in Midwest

Terry L. Hollern is now servicing pulp and newsprint accounts in the Middle West for Powell River Sales Corp. Mr. Hollern is in the company office at 20 North Wacker Drive, Chicago; the telephone number there is Central 6-2773.

H. & W. Men Get New Positions

The appointment of John J. Penhaker and Clarke H. Morian, Jr. to the newly-created positions of manager of merchant sales and manager of converter sales, respectively, has just been announced by Jack B. Cowie, sales manager of Hollingsworth & Whitney Co. Penhaker and Morian will continue with their present headquarters at the company's eastern sales division office, 230 Park Ave., N. Y.

Mr. Penhaker has been in sales for several years. He first joined the company in 1919. Mr. Morian joined H. & W. in 1946.



Saturating felts . . .

with
high
wood-pulp
additions.

Because of lower manufacturing costs, modern dry felt producers are looking to wood pulp as a partial replacement for rags in the furnish. On this service, Sprout-Waldron Refiners are the natural complement to the preliminary attrition of the heat and chemically softened wood chips. They assure high tonnages and discharge the pulp as slender fibers without degradation.

In felt production, S-W Refining improves quality and uniformity of saturation. Excellent folding properties are maintained.

Let us consult with you on your problem.


SPROUT-WALDRON & CO.
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**One
contractor
for all phases
of
PULP
and
PAPER MILL
construction**

**BRITISH COLUMBIA
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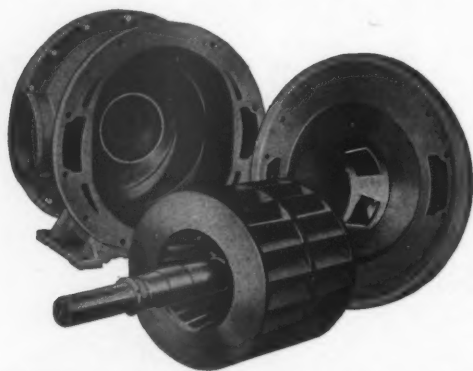
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Dryer
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S I M P L I C I T Y



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Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

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